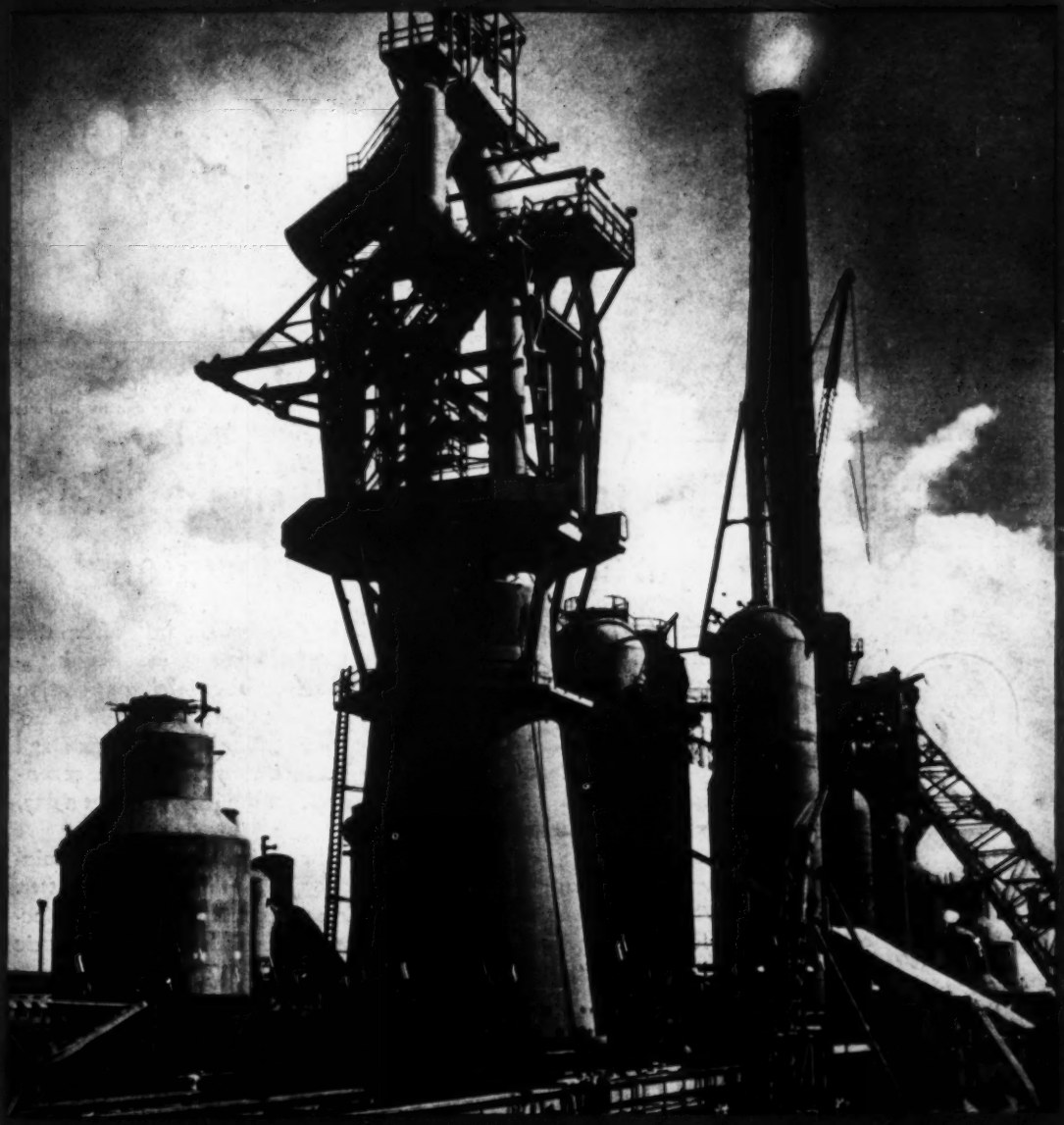
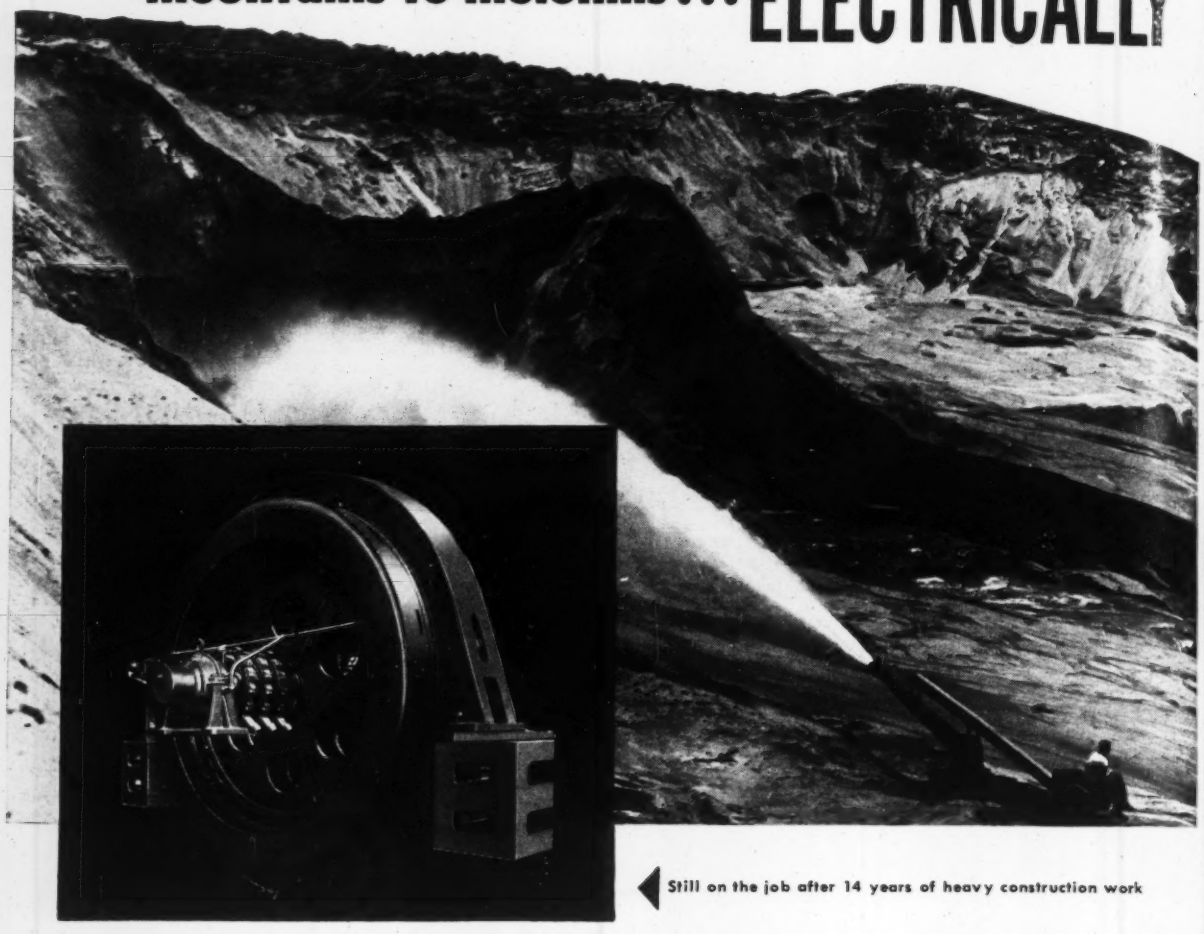
ENGINEERING NEWS-RECORD

OCTOBER 7, 1948



A McGRAW-HILL PUBLICATION

mountains to molehills... ELECTRICALLY



Still on the job after 14 years of heavy construction work

Veteran G-E Motors Drive the Pumps on this Hydraulic Sluicing Operation

One 14,000,000-yard sand dune will be dissolved by water from this nozzle to make way for the construction of Los Angeles' new high-rate activated sludge plant. This unique hydraulic sluicing operation depends for its pumping power on six giant General Electric induction motors built back in 1934 for construction of Fort Peck Dam. After serving successfully on that project, they have been reconnected for a different voltage to go back on the job 24 hours a day, six days a week.

Electric drive, which offers the maximum in reliability with minimum maintenance, helps contractors build more for less . . . faster. Whether you buy or build construction tools, ask your General Electric representative to tell you about the inherent advantages of electric drive. *Apparatus Dept., General Electric Co., Schenectady, N. Y.*

ELECTRIFIED CONSTRUCTION
BETTER PRODUCT
LOWER COST

GENERAL ELECTRIC

THE CONSTRUCTION WEEK

RIVER DEVELOPMENT SURE—Whether a Republican or a Democratic president is elected, dam building is certain to loom large in the future construction picture. The candidates are blunt beyond usual political promising on that score. Dewey's views, not widely known before, make the biggest news. He is for accelerated river basin development for power, irrigation and navigation. He is against the TVA concept of centralized federal action, but favors regional projects in which local interests have an effective voice. Whether this presages support for the authority idea, or for cooperative action among the Corps of Engineers, the Bureau of Reclamation and state and local officials, is not spelled out. We already have the latter in the Missouri Valley. It could be expanded and still keep within the bounds of the political promise.

RECLAMATION BOSS—The next commissioner of Reclamation may be Frank A. Banks present head of the Columbia Basin project. Both Republicans and Democrats in the west are urging his appointment. Principal stumbling block will be Mr. Banks' reluctance to leave the west for a desk job in Washington. He is one of the outstanding engineers in the Bureau of Reclamation, guided Grand Coulee construction.

STANDARDS FOR MILITARY CONSTRUCTION—Look for something to be done by the construction branches of the armed services to foster college graduate studies in the field of simplification and standardization of types of military shelter, perhaps of bridging. Conferences have been held in Washington with those objectives in mind. The large R.O.T.C. enrollment in the colleges includes many prospective research fellows. They have to write a thesis anyway, and proponents of the standardization idea argue that the subject chosen might well relate to such an urgent practical problem as military construction.

HOW TO GET STEEL—It might not work every time, but in at least three instances recently builders have been supplied structural steel when they made known their intention to use competitive materials rather than wait months for delivery of steel. In one case, a building was completely redesigned to use reinforced concrete; no sooner were the plans filed and approved than the steel people found means to make delivery as required. In another situation, where the builder was given the option to use concrete instead of steel-framing on which he was low bidder, plans for a redesign were just getting under way when steel suppliers said they could provide what was needed. And in a third case, where a designer candidly announced that he was going to prepare plans for a timber structure although steel was his choice, he got unexpected assurance that fabrication would be expedited if the design were submitted in steel.

IF BOMBS FALL—Protection of electric generating plants against bomb damage in the event of war is being studied by the Munitions Board. Information on the project is under security restrictions, but Army sources disclosed this week that they were studying "existing and typical" hydro plants. On completion of these investigations, the Chief of Engineers will recommend engineering and policy procedures.

The problem is of extreme and immediate importance to the power industry, with its huge program of expansion now on the drawing boards or beyond, and to federal agencies constructing numerous hydroelectric facilities.

INDUSTRY BUILDS AGAIN—After a sinking spell early this year, industrial expenditures for plant and equipment have rallied to record levels again. The Commerce Department and the Securities Exchange Commission estimate they will total $18,600,000,000, up 15.2 percent over 1947.

The figure should not be confused with industrial construction, since it includes over $15,000,000,000 for equipment as distinct from the $3,300,000,000 for buildings. But this building item is up 3 percent over last year. It could rise farther since ENR's new capital figures for private engineering construction are nearly twice what they were last year at this same time.

HIGHWAY BUILDING LAGS—Evidence of the unusual times we are living in is found in pleas made at the highway officials meeting in Salt Lake City to the heads of the highway departments of many states to speed the letting of contracts for their federal-aid road work. The current rate of expenditure is far behind the amount authorized under the 1948 highway act. Inability to find men to make surveys and prepare plans and specifications is a basic difficulty. Meanwhile, leaders in the highway field fear that Congress, seeing the failure to take up current money, will cut future appropriations at about the time that they will be most needed and when current scarcity of engineers will have been relieved.

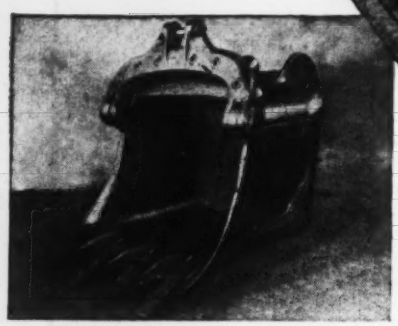
PIPE FOR ARABIA—During the next few weeks a decision must be made which will determine when and if the Trans-Arabian pipeline project will be completed (ENR May 20, Vol. p. 740). The problem is one of steel supply. No steel export licenses were granted for this purpose during the July-September quarter due to the efforts of Senator Wherry's Small Business Committee. Present indications point to a decision by Secretary of Commerce Sawyer favoring the allocation of 50,000 tons of steel to the American-Arabian oil interests in this next quarter. Wherry will protest, but Marshall and Forrestal are pressuring for pipeline to get more oil to fuel ECA countries and the U. S. fleet.

SUSPENSION BRIDGES—There is cause to believe that the wraps will soon be removed from the findings of the Advisory Board on the Investigation of Suspension Bridges, set up in 1942, as a result of basic design questions raised by the failure of the Tacoma Narrows Bridge. Aerodynamic forces on models have been studies in wind tunnels, movements of the Golden Gate Bridge have been measured and many theoretical analyses and laboratory tests carried out. In the face of some criticism, the Board has stuck to its original contention that any progress reports would be premature, possibly give rise to incorrect and harmful conclusions. Its own conclusions will deal particularly with methods of countering aerodynamic forces.

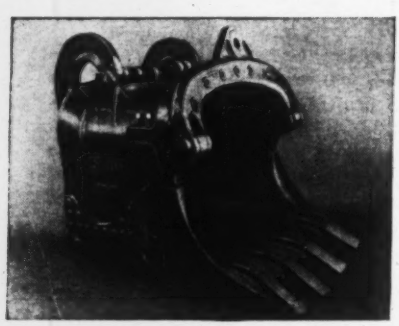
WHEN A BIG BITE.....

isn't bad manners

An Amsco 2-yard All-Manganese-Steel Welded Type Dipper gulps up a king-sized chunk of sandstone on a West Virginia airport job.



The Amsco All-Manganese-Steel Welded Type Dipper. Plug-welding of overlapping, rabbeted castings gives strength with minimum weight.



The Amsco All-Manganese-Steel Renewable Lip Dipper. Extra ruggedness throughout plus a quickly removable and renewable lip unit.

There's no etiquette involved when power shovel dippers dig into the job at hand—the bigger the bite the faster the pace set for the operations which follow. Designed to move more material every shift and with the stamina to keep delivering bigger payloads hour after hour, Amsco dippers undercut job estimates with maximum production and minimum maintenance.

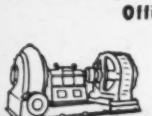
Sharp, widely-spaced teeth are "fanned" slightly for scooplike, full bite of material. Lip is smoothly contoured with curved, easy-penetrating sides. Interiors are smooth to prevent clay building or arching of material . . . tight-fitting parts eliminate crevices and pockets where material can collect. The four-way taper out to door assures immediate discharge of entire load . . . latches hold securely; release instantly. The result: fast, full loading with minimum "crowd" and quick, complete dumping.

Manganese steel is used throughout to give these dippers even greater efficiency and service life. The more you abuse it the harder and more highly polished the surface becomes to fight abrasive wear and improve penetration and dumping. While the body metal remains "the toughest steel known" to counteract the severest stresses, the surface work-hardens under impact to as high as 550 Brinell. Send today for Bulletin 547-DS.

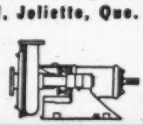
AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.



MANGANESE STEEL CASTINGS
"CHROME-MOLY" STEEL CASTINGS
HARDFACING ELECTRODES
GRINDING MILL PARTS



DIPPERS DREDGE PUMPS CRUSHER PARTS SOLIDS PUMPS BUCKETS WHEELS

ENGINEERING NEWS-RECORD

OCTOBER 7, 1948 VOL. 141 NO. 15

Apprentices seen only hope for sick bricklaying craft

Depleted ranks in the bricklaying trade call for "apprentice transfusions" if this major construction shortage problem is to be solved

R. H. Dodds

Bricklayers are too few; bricklaying is too costly.

These intimately related conclusions arise significantly from *Engineering News-Record's* 50-city, nationwide construction problem survey reported Sept. 9 (p. 1), and the first conclusion is confirmed by more recent reports. *ENR* correspondents gathering wage rate data in 66 cities found skilled labor shortages in 46 cities. Bricklayers were shortest in the majority of instances.

Engineering News-Record interviewed agencies concerned with bricklaying as well as employer and employee groups in several regions of the country to find the reason.

Their answers reveal that the supply of bricklayers, depleted during the depression and war years, has not responded adequately to the current demand because of inflexibilities and shortcomings in recruitment procedures. The shortage is intensified by factors that act to reduce individual output such as ease of getting other jobs and advanced average age of bricklayers.

As to costliness of bricklaying, reduced individual output plays an important role. Another cost factor resulting from the scarcity is the high bricklayer wage ($2.41 in a national average, 6 cents higher than the next trade, plasterers), attributable to preferred bargaining position.

Signs point out weakness

The net of the situation is that bricklayers, the elite of the construction trades, belong to a sick craft that is a drag on building progress and a threat to its own future. Such signs of the times as the switch away from brickwork for all telephone company buildings in California, as well as for the Metropolitan Life Insurance Co. housing project in the same state, point up the seriousness of the malady. Transfusions, in the form of more apprentices, are regarded as the only means available to arrest it.

Today, for example, there are 100,000 journeyman bricklayers in the United States, compared with 150,000 in 1925, the last high peak in brick construction. A pronounced result of the dwindling bricklayer ranks has been a steady advance in the average age of the men. From 1930 to 1940, the age rose from 41 to 44. When war cut off the supply of young men, the rate of advance increased; today the average, now dropping, is about 50.

An Associated General Contractors' representative estimates that five percent of a labor group is lost annually through normal causes. The high age average among bricklayers might indicate a higher percentage, but another source places the normal percentage at three.

Most bricklayer apprenticeships run three or four years, so that now, three years after V-J day, there should be 5,000 to 10,000 apprentices in training merely for a replacement rate that will stabilize the bricklayer supply, let alone fill out today's shortage. The Structural Clay Products Institute, spokesman for the brick manufacturers, places the shortage at 40,000. Since the war, the number of bricklayer apprentices under Department of Labor Joint Apprenticeship Committee auspices has increased to 12,000, but the rate of enrollment now is decreasing, despite high bricklayer pay and vigorous cooperation by the bricklayer's international union and by contractors in most parts of the country. Meanwhile, apprentice-graduation rates have increased slowly from practically zero to a rate of now about 100 per month.

Problems of recruitment

Factors cited as discouraging recruitment are the long apprenticeships and nepotism on the part of local unions, who have the final say-so on an appli-

(*Continued on p.* 10)

Producers' Council talks cost cuts

Reduction of construction costs was the target of the Annual Fall Meeting of the Producers' Council, held last week in New York City.

Douglas William Orr, president of the American Institute of Architects; William Muirhead, secretary-treasurer of the Associated General Contractors of America; and Carl G. Lans, director of the technical service department, National Association of Home Builders, outlined what their respective groups are doing to keep costs down.

The meeting also heard that the council now has 101 members, 76 of whom are manufacturers of building materials and equipment, and the remainder trade associations.

Although the increase in construction costs since 1945 is not out of line with that of other commodities and services, as pointed out by Mr. Muirhead, the speakers indicated that the AIA, AGC and NAHB are actively engaged in programs aimed at lowering costs. These include cooperative action with other professional societies to improve the efficiency of construction operations, standardize bidding procedures and simplify specifications. They are also cooperating with labor and have made excellent progress toward eliminating jurisdictional strikes.

David S. Miller, outgoing president of the council, told the meeting that cooperative action with the AIA to promote modular coordination will continue. He said that studies are now under way to apply this technique to multi-story housing.

New officers elected by the Producers' Council include: president, James M. Ashley, director of public relations, Libbey-Owens-Ford Glass Co.; 1st vice-president, C. R. Raquet, vice-president, Detroit Steel Products Co.; 2nd vice-president, A. Naughton Lane, vice-president, Monarch Metal Weatherstrip Corp.; secretary, C. A. Snyder, president, Richmond Screw Anchor Co.; and treasurer, W. V. Peters, vice-president, Truscon Steel Co.

NEWS BRIEFS

Bridges—State highway officials of *Washington* and *Oregon* have authorized a survey to determine whether a toll bridge should be built across the Columbia River at *The Dalles* . . . First caisson has been sunk for the new $10,000,000 bridge to cross the Mississippi River from *East St. Louis* to *St. Louis*. The caisson goes 105 ft. below the river surface to bed-rock . . . Superstructure work on the East Highway Bridge across the Potomac in *Washington, D. C.*, will begin Dec. 1 . . . The Southern Railway System will build a new double track steel bridge over the Cumberland River, near *Burnside, Ky.*, to replace an existing 1,400-ft. structure.

Housing—John A. Johnson & Sons, Inc., are low bidders at $6,531,373 on a group of 500 permanent houses at *Oak Ridge, Tenn.*, for the Atomic Energy Commission. . . . Fred B. Wilson is sponsor for 500-unit apartments to cost $4,000,000 and to use about 37 acres of land in DeKalb County, Ga., near *Atlanta*. . . . There are 344 apartments in the new Larchmont Gardens at *Miami, Fla.*, and at *Miami Beach*, Jack C. Stein of Atlanta, Ga., will build and apartment project of 120 units. . . . An application for state loan and subsidy payments has been approved for two public housing projects in *Buffalo, N. Y.*, to house 830 low income families. . . . Plans have been announced for a $2,500,000 garden apartment project on a 48-acre tract in *Kenilworth, N. J.*, by the Blue Ridge Manor Co. of Newark.

Sewers and Water Supply—Plans have been submitted by Bevington, Taggart & Fowler Co. for a $1,000,000 sewerage expansion at *Bedford, Ind.* . . . Plans for a new well field and water treatment plant to cost about $9,000,000 have been revealed by W. A. Glass, director of the water department of *Miami, Fla.* . . . Construction is nearly completed on doubling the purification facilities of the *Indianapolis* Water Co. . . . *Helena, Mont.*, will sell bonds for water and sewer improvements to cost about $1,000,000. . . . According to the Federal Works Agency, Connecticut needs to spend more than $60,000,000 on water supply facilities and sewerage systems.

Labor—An agreement covering approximately 3,000 operating engineers in eastern *Washington* has been reached with the Spokane chapter of the AGC. The union will receive wage increases of 15 to 35 cents an hour for its members, effective Jan. 1, and a 10-cent hourly cost-of-living increase was put into effect on Sept. 25 . . . In what is reported to be the first case of its kind, the *Hartford, Conn.*, painters union has been convicted in U. S. District Court of violating the Taft-Hartley Law. The union was charged with spending funds for political advertising, and was fined $800. . . . In an agreement retroactive to Aug. 1, the carpenters of northwest *New Jersey* have received a new dual scale; $2.50 per hour on commercial work and $2.25 per hour on alterations, jobbing and small residence work.

Public Construction—New construction in *Chicago's* medical center during the next five years will total more than $50,000,000. This is half the cost of the long range program in view; plans include an Institute of Tuberculosis Research, a veterans' hospital, and a $6,000,000 tuberculosis preventive hospital with 500 beds. . . . Voters of *Harris County, Tex.*, will receive for approval on Nov. 2 a $6,000,000 bond issue to build a new county courthouse. . . . The Board of Public Service, *St. Louis, Mo.*, has approved plans for grading and drainage of the proposed extension project at the Lambert-St. Louis municipal airport, to cost $2,200,000. Bids will be received on Oct. 26. . . . The Veterans Administration announces acceptance of a $4,400,000 low bid for construction of a 100-bed general medical hospital at *Miles City, Mont.* The low bidder was Lease & Leighland Co., of Seattle.

Highways—Rentals and royalties received by the state of *Connecticut* from three state-owned gasoline stations on the Merritt Parkway paid nearly all maintenance costs of the parkway last year. Receipts totaled $245,000. . . . Ohio state highway employees have begun work on *Akron's* $11,210,000 superhighway. Borings are being made to determine subsoil conditions on the first north-south link of the planned city-wide highway system. . . . Two more states announce the extent of proposed highway work: a $100,000,000 state highway program bill will be considered by the incoming *Massachusetts* legislature, and in *Indiana* the State Highway Commission will ask for a total appropriation of $87,966,000 for the biennial period of 1949-1950.

THE COVER PICTURE

A new technique of off-site blast furnace construction has been developed and was used by The Eichleay Corporation at The Youngstown Sheet and Tube Co. Indiana Harbor, Ind., plant.

This replacement furnace began its daily production of 1,400 tons of pig metal on Sept. 17, just 95 days after the old furnace was extinguished.

The 650-ton furnace shell was constructed on a trestle and moved into place on rails—its center of gravity 109 ft. above the yard level. Jacking the structure down onto its foundation required the efforts of 38 men, working in perfect unison.

Asphalt low by $1 million in 15-mi. road bidding

At Concord, N. H., last week bids were opened on 15 mi. of dual highway to be the New Hampshire Turnpike—extension of the Maine toll road.

Lowest of nine bidders was A. I. Savin Construction Co. of East Hartford, Conn., who submitted two bids. Low of $5,244,975 was submitted for asphalt paving and $6,266,395 for concrete. High bidder asked $8,466,000 for the work.

The contract includes structures, drainage and grading of the four-lane stretch from Portsmouth south to connect with the proposed Massachusetts cross-state system.

States plan big budgets for 1949 highway work

A list of major highway construction projects for the 1949-50 fiscal year totaling nearly $70,000,000 was approved late last week by the California Highway Commission.

The commission also budgeted $17,701,500 for acquisition of rights of way.

The 1949-50 fiscal year will be the first in which the state's highway division reaps the full benefit of new tax revenues voted by the state legislature in its approval of the Collier-Burns Act last year. (*ENR*, July 10, 1947, vol. p. 21.) The act made $70,000,000 available annually for the division.

Meanwhile recommendation that Washington state spend a minimum of $67,128,000 yearly on improvement of its highways has been made to a legislative interim committee by a staff of engineers under the direction of G. Donald Kennedy of the Automotive Safety Foundation, Washington, D. C.

Correction

Captain Edward E. Saunders, assistant chief for plans and research of the Bureau of Yards and Docks, Navy Department, is a regular CEC officer, and not a reserve officer, as reported in *ENR Sept. 16, p. 69.*

To study Long Beach, Calif., subsidence

The Stanford Research Institute has been retained to study causes of earth subsidence in the Long Beach, Calif., area and perform research work on possible remedial measures.

The institute, associated with Stanford University, was retained by the Harbor Subsidence Committee, a group representing the various interests affected by the subsidence. Studies already under way will be continued (*ENR* Apr. 29, Vol. p. 645 and Proceedings, ASCE, Oct. 1947), and new ones will begin.

Maximum subsidence to date is about 8 ft. This has threatened the serviceability of such structures as Navy wharfs and drydocks, harbor department docks, power plants, bridges, and industrial installations.

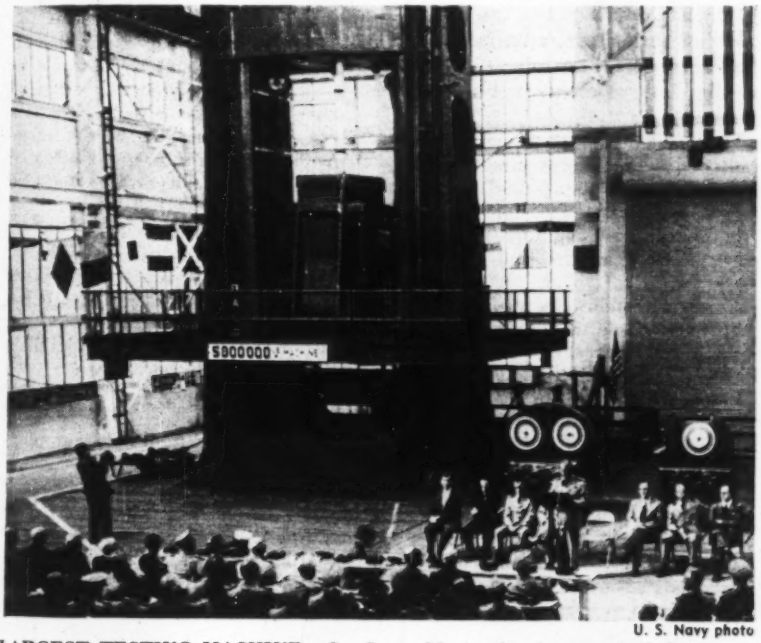
Possible causes

A sub-committee of the Harbor Subsidence Committee lists the causes believed to contribute to the total subsidence as follows: removal of water from water bearing sediments; loading of the area with structures, earth and other weights; vibration of sediment incident to earth shock and land use; the removal of gas and oil; and crustal changes in the earth due to movements along faults. One job the Research Institute will be called on to do is to assign values to these separate factors for their exact contribution to the subsidence.

Remedial measures suggested include some form of maintaining sub-surface pressure or perhaps restoring some that had been lost. This could be done by pumping water back into the sands.

The Harbor Subsidence Committee consists of representatives of the oil companies involved, the Southern California Edison Co., the Navy Department, the Long Beach Harbor Department, and railroads and industrial concerns with facilities located in the subsidence area. Chairman of the committee is E. J. Amar, port manager, Long Beach Harbor Department.

The research set up for an initial six-month period by a $100,000 fund will be directed by Thomas Poulter, associate director of the institute. To assist him, R. B. Vaile, Jr. has joined the staff as project leader. He was formerly assistant chairman of physics of the Armour Research Foundation. Karl Terzaghi of Harvard and Nabor Carrillo of the University of Mexico will be consultants.



U. S. Navy photo

LARGEST TESTING MACHINE—On Sept. 23, in the Aeronautical Structures Laboratory at the Philadelphia Naval Base, the largest universal testing machine in the world was demonstrated for the first time officially. The 5,000,000-lb. capacity machine was built to Navy specifications by The Baldwin Locomotive Works. It accommodates specimens up to 30 ft. high, 10 ft. wide between columns and 50 ft. long, for tension, compression or flexure tests. Load is applied downward by the crosshead, which is supported on two 55-ft. screws. Hydraulic loading pressure is applied by a 75-hp. electric-motor-driven pump of 3,000-psi. capacity, which produces testing speeds up to 3 in. per min.

ASCE dues amendments fail to gain two-thirds vote

Two constitutional amendments, one to increase dues and the other to eliminate a regional inequality in dues, were rejected Oct. 1 by the membership of the American Society of Civil Engineers.

The first measure, which would have increased basic dues by $5.00 ($2.50 for juniors) missed the required two-thirds affirmative vote by 515, with 5,898 out of 9,620 voting. Elimination of $5.00 extra dues now paid by members residing in the New York Metropolitan area was defeated when only 4,634 out of 9,193 voted "yes"; this was 1,494 short of the required majority. Passage of the second amendment was conditioned on passage of the first.

Dues increase also was rejected a year ago. (*ENR*, Oct. 23, 1947, Vol. p. 555).

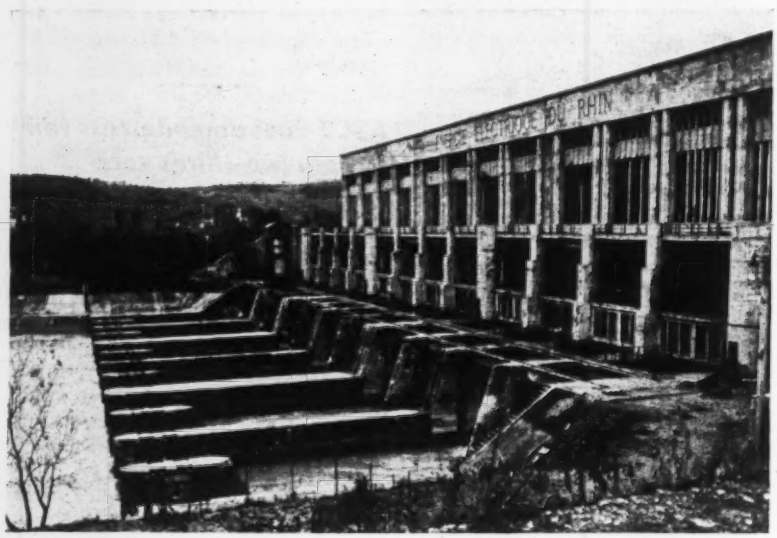
Work starts on Park Forest, big new Chicago suburb

Work is going forward in Park Forest to complete the new residential and shopping center designed for a population of 30,000 persons by American Community Builders, Inc., on a 2,500-acre site 27 miles south of Chicago.

The project will have broad, winding streets, its own schools, churches and playgrounds. The first phase of the development is construction of rental units for 250 families. Another 3,000 rental units will follow quickly. When these are completed, work will begin on 5,000 individual homes for sale. Construction schedules call for occupancy of the rental units by the summer of 1949. Rentals as planned, will range from $72 to $95 a month on three-year leases. Veterans will be given preference as tenants.

The dwellings will feature broad expanses of glass, with plenty of the new picture windows to provide the effect of living outdoors. Houses will be staggered on the winding streets so that each unit will have some privacy. No uniform pattern of architecture has been adopted. Individuality of the units is carefully planned to avoid the stereotyped mass housing effect so evident in many housing projects. Most of the houses will be multiple units set back from the curb a minimum of 120 ft.

FOREIGN DEVELOPMENTS



POSTWAR POWER OUTPUT in France depends in part on restoration of facilities such as Kembs power plant on the Rhine which was one of the French plants badly damaged during the war.

London—Britain's vast colonial development program is moving into high gear. Some $4,000,000,000 in sterling has been tagged for colonial investment from public and private funds up to 1956. In addition, London has applied for ERP dollars for the British colonies, to buy agricultural machinery and other necessary capital goods that only the United States can supply. No. 1. target of the whole development program—for both economic and strategic reasons—is Africa.

Britain hopes to raise colonial production during the next ten years by $800,000,000 annually. This increase would go a long way toward overcoming the United Kingdom's annual dollar deficit of $2,000,000,000. It would directly earn dollars, because the U. S. is a much better market for colonial foods and raw materials than for British manufactured goods. Lord Trefgarne, Chairman of the newly-launched Colonial Development Corporation, has significantly observed that in 1947 the U. S. spent more than three times as much on its coffee imports as on British manufactures.

U. S. Investments

American companies and American private capital will be free to participate in this whole development program on exactly the same terms as British investors. This free access is guaranteed in the Economic Cooperation Agreement signed by the U. S. and the U. K. in July; it is also incorporated in the public policy of the British Government agencies responsible for colonial development.

The full exploitation of African minerals, like most economic development in the interior depends on provision of more adequate transport facilities. For transport is the biggest single bottleneck in the drive to tap the Dark Continent's resources.

In British East and Central Africa, railways have mushroomed over the years without rhyme or reason, wherever new industries arose. All five main lines, single tracked and in need of additional sidings, generally run east and west with no north and south connections. East African railways are meter gauge (39.37 inches) and are lightly laid (45 lb. rail); Central African lines are 3 ft. 6 in. gauge, with medium-weight (60 lb.) rail. All of them suffer from shortage of locomotives and freight cars.

Over $14,000,000 of Colonial Development funds have just been set aside for immediate improvement of communications in East Africa. Half of this amount will go into the Great Trunk Highway linking Northern Rhodesia with Tanganyika, Kenya and Uganda. It is scheduled to be completed within four years. Surveys have also been undertaken for a railroad link to open up the Rhodesias to the sea through Tanganyika. This long-range project would involve conversion of East African tracks to the Rhodesian and South African standard gauge of 3 ft. 6 in. It has beeen temporarily set aside, however, because its high cost ($140,000,000) could be justified only on strategic grounds. Meanwhile, air transport facilities—freight, charter, and maintenance—will be developed in East Africa through private initiative by Airwork (East Africa) Ltd., a new company formed for the purpose last month.

Power is needed

Cheap power and lots of it is needed to establish secondary industries in Africa. The threatened extinction of cacao trees in Nigeria and on the Gold Coast has underscored the danger of relying on one-crop economy. Some private manufacturing ventures are now hand—soap in Nigeria, cement in Northern Rhodesia, and textiles in East Africa. But more power is a must to extensive factory growth.

Chief among several important hydroelectric schemes to spur colonial industries, and to boost the African standard of living, is Uganda Owen Falls project. Consulting engineers from two London firms—Sir Alexander Gibb and Partners, and Messrs. Kennedy and Donkin—designed this $28,500,000 power station to house eventually eight water-turbine-driven alternators rated at 15,000 kw. each. Size of the initial installation will depend on outcome of talks with the Egyptian Government, which needs the same water (Victoria Nile and Nile River system) for irrigation. But present indications are that three 15,000 kw. units will be installed in the initial project, slated for completion by 1953. New industries are likely to trail Uganda's power house: textile mills for its cotton crop, paper mills to utilize elephant grass, processing mills for Kilembe copper, fertilzer plants for Tororo phosphate, and a plant to cure tobacco by electricity.

Other hydro-electric plans

Other huge water-utilization plans include:

An ambitious hydro-electric scheme for the Rhodesias. Among its uses would be power to produce electrolytic copper in Northern Rhodesia and ferrochrome in Southern Rhodesia. As interterritorial hydro-electric commission is about ready to decide between two altertives. The first is a ten-year construction project at the Kariba Gorge, on the Zambezi River in Southern Rhodesia. It aims at producing 750,000 kw. and would harness more acre-footage of water (53 million) than is now held in check by the two largest American dams combined. The second alternative is a 350.000 kw. project which may be set

up on the Kafue River, tributary of the Zambezi in Northern Rhodesia.

A dam on the Volta River, near Ajena in the Gold Coast. It would impound a reservoir of about 1,200 square miles, with greater capacity than that of the Hoover Dam, and would generate power to refine large deposits of bauxite.

Regulation of Lake Nyasa and the Shire River—to improve navigation, provide water for irrigating rich cotton soil in Nyasaland, and make it practicable to construct a hydro-electric station below the Murchison Rapids of the Shire. A three-year hydrological survey for this complicated scheme, financed with Colonial Development funds, is now under way.

The government's approach to colonial development has been on a grandiose scale. Thus far, however, it has not moved very much beyond the talking stage. Vast sums have been set aside for Britain's own "Marshall Plan" for the Empire. But voting the money alone will not do the job. Only half of the funds voted for specific purposes by Parliament under the Act of 1945 were actually spent in the first two years of the ten-year plan.

There is still little evidence that Britain's economic return from the colonies will justify the cost—in money, men, machines, and goods—in the next 15 or 20 years. The chief gains are likely to be political and strategic. Britain's heavy investment should help to promote some settlement of its surplus population in Africa, integrate the Empire, and provide a valuable military stronghold for any future war in the Middle East.

Public works

India—Faced by a shortage of construction engineers to administer its manifold public works projects, the Indian government is studying the prospect of "drafting" army personnel into the work. One of the major problems, however, is the reverse of that often found abroad—the fact that military personnel is better paid than private engineers. If the plan goes through, it will necessitate a complete resurvey of the costs of any job where army engineers are taken on.

New Zealand—The government plans to spend $144,000,000 over the next seven years on hydroelectric power development projects with a combined capacity of 750,000 kw. This compares with capacity of 597,000 kw. now in operation, including 142,000 kw. added during the last twelve months.

The most important projects now in hand include expansion of the Lake Waikaremoana stations, new dams on the Waikoto River and additional plant in the South Island.

One of the stations to be built on the Waikoto River will be the largest hydro plant in New Zealand.

Mexico—Plans have been approved by the Mexican Hydraulic Resources Ministry for the building of a 109,000,000-cu.m. capacity dam to irrigate 40,000 acres in the Loma Prieta district, Nuevo Leon State, on the eastern Texas border. Tentative cost of the dam is $3,000,000. Work is to start in 1949.

Technical school aids Sao Paulo's growth

Eugene E. Halmos

Design Consultant, Knappen Tippets Abbett Engineering Co., New York

While its phenomonal growth has led the city of Sao Paulo, in Brazil, to be called "the Chicago of South America" and its rapid industrial expansion has held the interest of engineers everywhere, little has been said or written of the source of the city's technical advances — Sao Paulo's Polytechnic School.

The Polytechnic School, visited by the writer during a recent stay in Sao Paulo, is a department of the University of Sao Paulo, a state sponsored and supported institution. It is governed within the framework of the university by a technical advisory board of six professors presided over by the school's director.

From a small beginning in 1894 the school grew very slowly up to 1932, averaging about twenty graduates annually. Since that year a notable increase in enrollment has occurred, bringing the total to nearly 700 students. In 1946 eighty-nine were graduated. This increase, however, falls far behind the rate of growth of Sao Paulo and its demand for engineering personnel.

The prime reason for the comparatively small student body is believed to be the fact that since its inception the school has labored under the handicap of a lack of housing facilities. It started functioning in a remodeled private residence. Even now, after over 50 years of existence, there are only four buildings available for administrative offices, assembly halls, libraries and classrooms. It would be impossible to care for a larger number of students in the existing buildings. However, the greatly increased facilities allotted to the Polytechnic School in the new University City now under construction in the westerly part of Sao Paulo should result in a much larger enrollment.

Five courses are offered: civil, architectural, mechanical and electrical, chemical, and mining and metallurgical engineering. The required period of study is five years in all departments except the mining and metallurgical which has a six-year course. This permits a curriculum which devotes two full years to thorough theoretical education as a basis for practical application in the various engineering fields. The students receive excellent training, which, in the writer's opinion, is on a par with that of the best engineering schools abroad.

The largest number of registrants is in the civil engineering department and amounts to 45 per cent of the total, followed by the mechanical and electrical department with about 30 per cent of the registrants.

There are over 20 different laboratories arranged within the campus which covers an area of about 600 feet square. Some of them are part of the Polytechnic School, but the larger number belong to the Technological Institute.

All laboratories are equipped with the best type of testing and recording apparatus and are operated by a permanent staff of engineers and mechanics. They are open to the students for study and exercise. At the same time they undertake testing and advising work for governmental agencies and for private enterprises. Thus, the laboratories perform the combined duties of engineering education, materials testing and those of a bureau of standards.

Achievements of these laboratories, particularly in the development of reinforced concrete construction, electrical and metallurgical processes and for the lumber, coffee and textile industries are truly remarkable and worthwhile.

The writer is indebted for the preceding information and data to Dr. Antonio Carlos Cardoso, professor of electrical engineering at the Polytechnic School, who made possible inspection of the campus and its facilities.

Bricklayer shortage seen big problem

(*Continued from p. 5*)

cant's eligibility. And in at least one city, contractors have been accused of unwillingness to hire all apprentices.

A Michigan contractor states that many boys do not sign indenture papers when they find that it will be three years before they can obtain full pay. Contractors in a southern, a far western and eastern city said unions discourage applicants for apprenticeship, making kinship with journeymen an important factor for admission.

On the other hand, contractors and union officials in two midwestern cities agreed that all applicants are accepted. Practices in those cities are in line with the advice given by international bricklayer union president Harry C. Bates, who since the war has been urging unlimited enrollment by all local unions. The locals, however, have autonomous powers to regulate proceedures, and all have not fallen in line.

A frontal attack on the length-of-apprenticeship is suggested by the statement of one union representative, that journeyman skill can be attained in one year. No such drastic reduction has been made by any local, although accelerated training programs involving pre-job bricklaying practice and classroom instruction have been used in many cities to reduce the term by six months or more.

The most widespread contribution by union locals to the apprentice program has been to overlook traditional apprentice-journeyman ratios, ranging roughly from 1:4 to 1:10. By this by-passing of rules, unions and contractors have been able to put on jobs as many apprentices as the type of work and the beginners' abilities warrant.

Contractor cooperation, too, is an essential element of recruitment procedure. In only one large city, New York, was evidence found that contractors are not employing all the available beginners. According to union records, at the end of August there were 804 bricklayer apprentices in New York where the highest bricklayer wages in the country, $3.20 an hour, are paid. On Sept 30, 45 boys were not employed. Orrin Hunter, New York leader, gave lack of contractor cooperation as the reason for the collapse last summer of a bricklayer-apprentice school that had opened in the spring. He stated further that the local ratio of one apprentice to five journeymen is not being enforced by the union.

How many bricks per day?

With the problem of increasing the number of men, little nearer a solution than it was at the end of the war is there any possibility of increasing the number of bricks laid by the individual? Plentiful jobs and aging craftsmen, it is generally remarked, are not conducive to high productivity.

One man mentioned slow deliveries of materials as a reason for low productivity, noting that a bricklayer would work slowly in hope that more bricks would show up before he "worked himself out of a job." He believed that this factor has disappeared lately, and that it had been due to postwar maladjustments in distribution rather than to strained capacity for brick production. The Structural Clay Products Institute says that its members today can produce 12 billion brick equivalents annually as against 6.4 billion actual production indicated for this year. (Peak years: 1926, 16.0 billion; 1937, 6.1 billion; the all-time annual output record for brick alone, 10.4 billion, was made in 1909.)

Cautious encouragement

Cautious encouragement for the individual production problem was given by a few of the interviewed, who said they thought they saw signs of faster workmanship. R. H. Berg, president of The Clay Brick Manufacturers Association of Northern California, reported that the tendency is definitely toward increased efficiency. He sees good prospect of improvement both in worker efficiency and in early relief from the bricklayer shortage.

One possible factor in individual bricklaying production was omitted from the summary above: Union restrictions on bricklayer output.

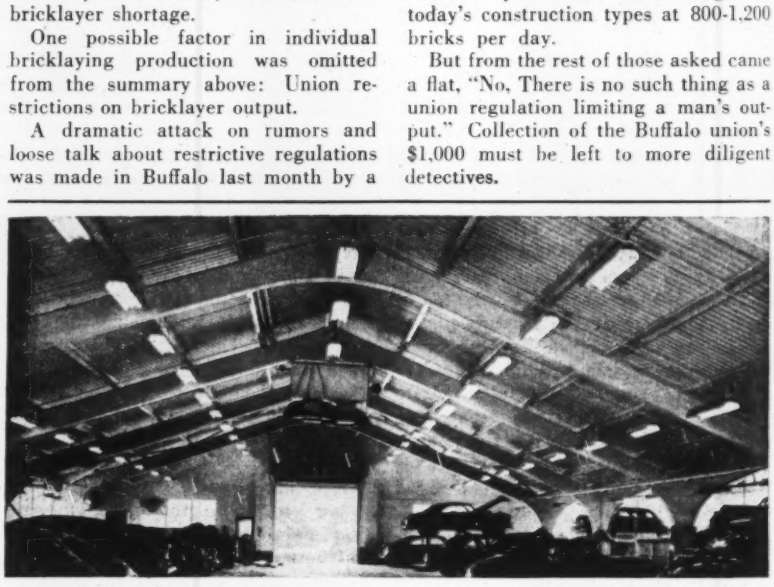
A dramatic attack on rumors and loose talk about restrictive regulations was made in Buffalo last month by a contractor and Local 45, Bricklayers Union (AFL). In a 2-page *Buffalo Business* advertisment contractor Howard F. Stimm and the union jointly assailed the popular "misunderstanding" that bricklayers now are laying fewer bricks per day because of indifference, lack of skill or union rules." For its part the union offered $1,000 "for any proof . . . that production was restricted."

Mr. Stimm enumerated many reasons why the mason today lays only a fraction as many bricks per days as he did in the past.

Hoping for a piece of that $1,000, *Engineering News-Record* asked each person interviewed whether he could furnish proof of output restrictions. A few southern contractors said they thought restrictions existed, but they couldn't prove it. An east coast contractor cited a bricklayer representative's offer to increase daily output per man from an observed 350, to 800, in return for Saturday work at double time. A western union rejected a proposal that its men lay brick on a piece-work basis that equalled about 400 bricks per day at prevailing wages.

Some others interviewed admitted ignorance of such requirements but commented further on individual output. Present performance rates estimated include "about 400" in one southern city and "700-800" in a midwestern city. The Structural Clay Products Institute estimated 83 bricks per hour as an average for all types of work. Another national association representative placed the ideal range for today's construction types at 800-1,200 bricks per day.

But from the rest of those asked came a flat, "No, There is no such thing as a union regulation limiting a man's output." Collection of the Buffalo union's $1,000 must be left to more diligent detectives.



WELDED RIGID-FRAME garage roof, spanning 70 ft., was designed and built at Newark, N. J., by The Austin Company to permit freedom of movement and best use of the 30,000-sq. ft. floor space. Garage also features under-floor motor exhaust ventilation systems and recessed floor lighting.

Colleges plan, start building programs

Extensive building plans are being considered by colleges and universities and in some cases work is actually under way.

Construction plans have been approved by the Board of Regents of the University of Texas at Austin, for a $4,000,000 science building and a $1,146,000 student health center. Bids on the construction work will be called for immediately to be opened Dec. 15.

The greatest building program in history of the University of Connecticut at Storrs is making rapid progress toward completion, according to a recent statement of President Albert N. Jorgensen. More than $7,000,000 are being spent in expanding the university's plant. Four of the new dormitories are in operation and four more will soon be ready. Present plans call for erection of three more dormitories. A $1,000,000 gymnasium with a swimming pool is expected to be completed by the fall of 1949.

A loan of $16,000,000 to Pennsylvania State College for the construction of dormitories has been approved by the State Employees Retirement Board. The present campus buildings will serve as collateral.

The University of Florida, Gainesville, is currently engaged in a $6,000,000 construction program. The total expenditure this year will be more than $10,000,000, the new structures including additions to the library and chemistry building and cafeteria and a new $1,000,000 gymnasium.

The University of Pittsburgh has received a gift from the Educational and Charitable Fund of the late Andrew W. Mellon amounting to $13,600,000. It will be used for a graduate medical school for public health, and according to Paul Mellon, the building will be erected as soon as the school is accredited by national scientific authorities for the granting of degrees of Doctor of Public Health and Master of Public Health, and as soon as the university schools in medical sciences and the hospitals of the Medical Center have been integrated.

Ground has been broken for a new $475,000 chapel on the campus of Pennsylvania College for Women in Pittsburgh. This marks the beginning of a major construction program which will include a dining hall, gymnasium, administration building and a classroom structure.

The University of Buffalo, N. Y., will erect a new three-story law school.

Choose Belton Dam site near Temple, Tex.

After months of extensive research and studies, the Corps of Engineers has announced the location of the Belton Dam soon to be constructed near Belton, Tex. According to Col. B. L. Robinson, district engineer, who is directing the design and construction of the project, the dam will be located approximately four miles north of Belton, and seven miles north of Temple.

During the last few months detailed foundation studies and borings were conducted to determine the most suitable location for the dam site.

The dam, which will now be constructed about one and one-half miles upstream from the Leon River Bridge of Texas State Highway 317, was designed for flood control and water conservation.

"We hope to have our plans sufficiently advanced to start construction of this project during the early part of 1949", Colonel Robinson said:

According to the government engineers, the dam will be approximately 1,900 ft. long, with a maximum height of about 200 ft. above the bed of the Leon River. It is estimated that about four years will be required to complete construction.

See possible labor tie-up of west coast building

Boilermakers unions in seven western states and Alaska have voted to strike against 369 contractors if their demands for a 25-cent hourly increase are not met.

Such a strike would close down all major building projects in the area.

The 13 AFL locals also are asking for four dollars per day subsistence instead of a present three, and seven cents instead of 5 cents travel mileage allowance.

One major construction project already has been closed down as the result of picketing by Boilermakers Local 39, Oakland, Calif.—the $18,000,000 Fibreboard Pulp & Paper Co. plant. This strike is against Swinerton & Walberg, San Francisco contracting firm, general contractor on the job.

Representing west coast contractors is the Western Field Construction Negotiating Committee. At the present time no negotiations are under way, nor has a date for a meeting with the union been set. The contractor group has offered to pay a 15-cent hourly increase or submit the whole matter to arbitration. Both proposals have been turned down by the union.

MAJOR MEETINGS

American Society of Planning Officials, national planning conference, New Yorker Hotel, New York City, Oct. 11-13.

Institute of Traffic Engineers, annual meeting, Hotel Warwick, Philadelphia, Pa., Oct. 11-13.

American Society of Civil Engineers, fall meeting, Statler Hotel, Boston, Mass., Oct. 13-15.

American Public Works Association, public works congress and equipment show, Copley Plaza Hotel, Boston, Oct. 17-20.

Federation of Sewage Works Associations, with annual meeting **Michigan Sewage Works Association**, Hotel Statler, Detroit, Mich., Oct. 18-21.

National Safety Congress, Stevens Hotel, Chicago, Ill., Oct. 18-22

Joint Meeting Four States and Western Pa. sections of A.W.W.A., Penn Sheraton Hotel, Philadelphia, Pa., Oct. 20.

National Conference on Industrial Hydraulics, Sheraton Hotel, Chicago, Ill., Oct. 20-21.

New England Highway Exposition, Commonwealth Armory, Boston, Mass., Oct. 20-22.

Structural Engineers' Assn. of California, annual convention, Biltmore Hotel, Santa Barbara, Calif., Oct. 21-24.

American Welding Society, annual meeting, Bellevue-Stratford Hotel, Philadelphia, Pa. Week of Oct. 24.

American Public Health Association, Boston, Mass., Nov. 8-12.

National Reclamation Association, Oklahoma City, Okla., Nov. 17-19.

To improve S. C. air base, rebuild Camp Kilmer, N. J.

An estimated $62,000,000 will be spent in the enlargement of the Greenville, S. C., base by the Air Force.

Nearly all existing buildings are expected to be replaced.

The Army, meanwhile, announces that Camp Kilmer, N. J., will become a permanent post. Col. W. W. Wanamaker, district engineer in the New York area has let a contract to Churchill-Fulmer Associates, Jersey City regional planners, for drawing up a master plan for rebuilding.

Plant to feature glass, climate conditioning

A controlled-conditions factory of reinforced concrete with extensive glass exteriors will be built for the Gruen Watch Co. at Cincinnati, Ohio.

On a 63-acre former golf course in a residential area, the structure will house factory, office and recreation facilities.

Designed by Woodie Garber, engineer, of Cincinnati, in collaboration with James E. Allen and Oscar A. Friedhoff, architects, the plant will be completed for 1950 occupancy by Frank Messer & Sons, Cincinnati.

MUNICIPAL AFFAIRS

What businessmen can do to meet city traffic and zoning difficulties was outlined at a conference on urban problems at Detroit, Mich., recently.

The conference, sponsored by the Chamber of Commerce of the United States, started with the premise that planning is the first step and that, in the words of National Chamber President Earl O. Shreve, "No community, large or small, can safely afford to postpone realistic planning."

Panel discussions were held on "Planning the Development of the Smaller Community," "Parking and Truck Loading," "City Streets and Modern Transportation," and "Planning and Redevelopment of the Larger Community."

Out of the discussions came a recommendation that municipalities spend more money for planning, and a request that businessmen interest themselves in the idea and volunteer their assistance.

Studies should be made by each community of its needs for parking space, for both shoppers and industrial purposes, and terminal facilities for truck loading and unloading.

The panels examined the "neighborhood concept" of city planning and suggested that blighted areas could be turned into industrial and commercial sites which would lay the groundwork for future development and provide more taxes for the community.

More decentralization expected

"The march of residential population, of industry and even of commerce to outlying areas has definitely started," President Shreve told the several hundred businessmen from all parts of the country attending the conference.

Paul Oppermann, member of the Board of Governors, of the American Institute of Planners, Washington, D. C., said "The smaller cities are offering some real competition to the metropolis. How else can we explain the slow down, the stoppage in many cases, of central city growth? Business and industry are aware of the advantages and benefits of small cities and towns. Operating costs, including taxes, are lower, both management and labor often get along better in the smaller places. Now the smaller communities are in the spotlight from another angle. They reduce our vulnerability to attack in the event of war.

Directing his remarks to the small suburban community, H. S. Osborne, Montclair, N. J., vice-president, Regional Plan Association, Inc., of New York City, said that because its characteristics depend on its relation to the metropolitan area as a whole, care should be taken that full cooperation and coordination are attained. He went on:

"It would appear that the best results could be assured by the establishment through voluntary efforts of a metropolitan planning agency having responsibility of coordinating the plans of the various local agencies."

While the central business district is the heart, and the nerve center of any metropolis, improvements there must not be undertaken in the way of competing with outlying shopping areas, Foster Winter, president, Detroit Municipal Parking Authority, warned.

Waterworks and Sewerage

The Connecticut Water Commission has ordered Bridgeport to proceed with the construction of the Bostwick Avenue sewage treatment plant and to build another sewage treatment plant on Power House Creek in the Seaview Avenue section. The Bostwick plant has been in various stages of construction for nine years.

The commission charges that untreated sewage which goes into Bridgeport Harbor and Black Rock Harbor is the largest and most serious sewage pollution problem in the state. Detailed construction plans and specifications for completion of the Bostwick Avenue plant must be submitted by next Jan. 1, bids to be advertised by March 1, 1949, and the plant completed, operations started by April 1, 1950. Plans for the Power House Creek plant must be ready Oct. 15, 1949, with bids by Feb. 1, 1950.

Bridgeport Hydraulic Co. has surveys under way for reservoirs in Trumbull and Shelton. Two new dams will be required, one on the Far Mill River and the other on the Pequonnock River system. Contour surveys are being made for two reservoirs. It is necessary to provide for ever-increasing population in Stratford and the East End of Bridgeport. These projects will add 17,000,000 gal. to the daily water supply. The Trumbull Dam would provide more water pressure at its altitude of 250 ft. and step up the gravity system. The company supplies water for Bridgeport, Fairfield, Shelton, Easton, Stratford and Westport.

A survey has been made of the sewerage problems of Muncie, Ind. In 1945 the State Board of Health issued a mandatory order for establishment of sanitary sewer facilities in the York Ditch watershed area, which city officials say presents the most urgent sewer problem.

As outlined by the engineering firm, Moore and Owens, there are two feasible plans for sanitation in the region. One is the construction of sanitary and storm sewers separately at an estimated cost of $750,000. The other is for a combined sanitary-storm system, to cost an estimated $1,020,000. The consulting firm favors the former.

A $1,000,000 sanitary interceptor sewer will be built next summer at Dayton, Ohio.

Asheville, N. C., will employ a consulting engineer to make a survey of the stream pollution and sewage disposal problems of the city, with the consulting aid of the TVA, Institute of Government of the University of North Carolina and the State Board of Health.

Considerable pollution of the Scioto River is resulting from the present inability of Columbus, Ohio, to treat all of its sewage while its sewage plant is being enlarged.

City Improvements

It is proposed that the voters of St. Paul, Minn., be asked to vote Nov. 2 on a bond issue of $5,000,000 to build self-liquidating low-rent public housing. The city would construct some 600 units at about $8,000 each, to be turned over to the housing authority for rental and management. St. Paul voters have already approved a $2,000,000 bond issue to improve their water system.

Virgil H. Hurless, deputy city comptroller of Milwaukee, Wis., has recommended to the long term improvement program technical committee a permanent improvement fund of $6,951,915, nearly double that appropriated by the city annually for the last five years.

More Water for Birmingham

A large industrial water supply system expansion program is being undertaken at Birmingham, Ala. City Engineer J. D. Webb said that the $2,000,000 program, on which surveys are now being made, calls for construction of a pipe line from Inland Lake, in Blount County, to Birmingham, and another from the lake to the Little Warrior River where additional water will be obtained. The project will increase the rated capacity of Inland Lake from 60- to 110-mgd. which is double the capacity of 55,000,000 gal. of the Birmingham Water Works Co., which is rated in filtered water, as against unfiltered water at Inland.

One pipe line extension will run six miles from the lake to Locust Fork on

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the Little Warrior and the other will run 32 miles from a new lake pumping station to Birmingham. It is expected that the survey will be completed within three to six months, while the entire project will take two years for completion.

Inland Lake was formed by an earth-filled dam on the Blackburn River in 1937-38 at a cost of $7,217,000, of which $3,217,000 was from Federal Public Works funds.

Buffalo Rehabilitation

The first step has been taken toward adoption of a multi-million dollar capital expenditures program in Buffalo, N. Y., along the lines recently recommended by the Municipal Research Bureau. The program envisages new schools, viaducts and scores of other badly-needed improvements. The common council has been authorized to appoint a committee to study all phases of a program to spend about $50,000,000 to "rehabilitate Buffalo". The committee would determine the priority of the many projects proposed after first giving full consideration to the city's financial resources.

Smoke Control

For more than a year research to determine the nature and origin of Los Angeles "smog" has been under way at the Stanford Research Institute, Stanford, Calif. Considerable progress has been made under Paul Magill, the work being sponsored by a group of petroleum companies as a public service to the community.

John L. Hodges, deputy smoke abatement engineer of Hudson County, N. J., heads the recently created Air Pollution Control Division of the Philadelphia Pa., Department of Public Health by selection of the Philadelphia Air Pollution Control Board. Some twenty candidates applied for the position which will pay from $7,650 to $8,650 a year. Dr. Rufus S. Reeves, health director, made the appointment after Mr. Hodges had been selected by the board.

Among the smoke control suggestions made by Robert L. Wolf, city combustion engineer of Indianapolis, Ind., are: A new ordinance on the subject; public collection and disposal of combustible waste matter; a new source of 200,000 tons of smokeless coal annually; and a new program of control of smoke from railroads. The Junior Chamber of Commerce of Indianapolis has asked Mayor Al Fenny to call a public hearing to discuss the smoke control problem.

A model smoke abatement ordinance for a rigid campaign against air pollution by dense smoke, soot, dust and gases has been passed by the city council of Kansas City, Mo.

Wide World photo

DOWN COMES "L" SPUR—Workmen apply torches to steel beams of a 54-year-old 'L' spur in Chicago, as structure is razed to make way for the Wacker Drive super-highway. The quarter-mile line, known as the Market Street Stub, ran between Lake and Madison streets on Wacker Drive. It was built in 1894 to serve the old Chicago and Oak Park Elevated Railroad's downtown terminal. Since the building of the loop to join the elevated lines running into Chicago, the stub's tracks have been used as a layover spot for Rapid Transit trains.

Airports

A study is being made of available sites for a class 5 airport at Shreveport, La., to cost $3,500,000 or more.

A contract has been awarded to S. J. Groves and Sons at $640,860 for various improvements at the Quad-City airport near Moline, Ill.

The new airport authority at Tucson, Ariz., has a $150,000 modernization project under way, and as soon as possible more facilities will be provided for private flyers. B. W. F. Schmidt is manager.

Municipal Briefs

Great Lakes Division of Engineers at Chicago has made a partially favorable interim report on proposed improvements of the Toledo, Ohio, harbor. Among other things, it recommended widening the channel opposite the Chesapeake & Ohio Railway dock, and other changes, at an estimated cost of $330,000.

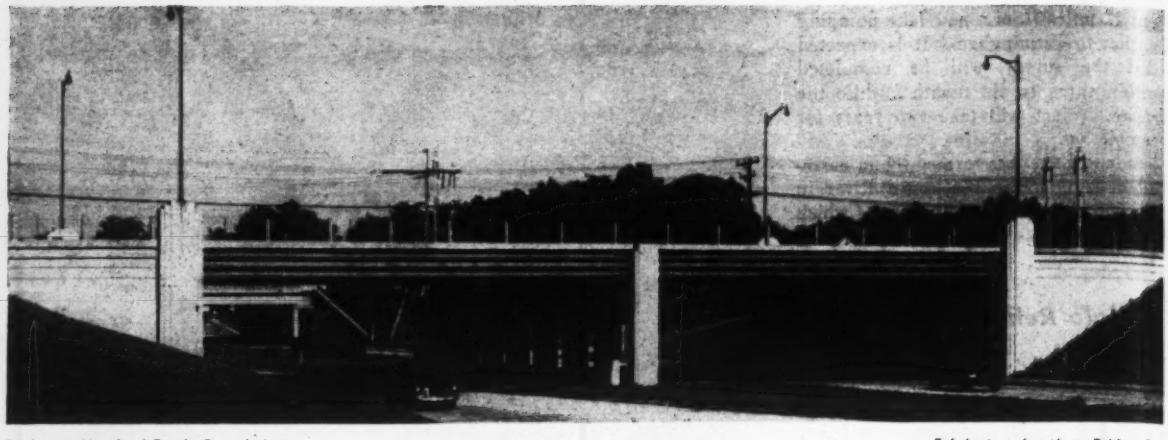
So that there will be no error as to the water pressure in its fire hydrants, the fire department of Lake City, Fla., is painting plugs red to indicate a rate of flow of 500 gpm., yellow, 500 to 1,000 gal., and green for a rate of 1,000 gal. or better.

Next winter Fargo, N.D., will charge property owners two cents per sq. ft. to shovel snow from their sidewalks if they don't do it themselves.

The Board of Estimate, New York City, has rejected the proposals of the Port of New York Authority and the state-chartered World Trade Corp. for rehabilitation and development of city piers. The board has decided on the $55,000,000 plan submitted by the Department of Marine and Aviation, under which the city itself will do the job, but it is not likely that any actual work will be undertaken for some time until the financing can be arranged.

Fort Wayne, Ind., has plans to have an aerial survey and map made of the city and a 2-mile area surrounding it so that engineers can make various surveys without the necessity of field study.

Work on the construction of the new union passenger depot for Akron, Ohio, will be started at once by the Clemmer Construction Co., of Akron, which obtained the contract on Aug. 30. It is understood that the building alone will cost about $1,250,000. The city council has provided for the construction of a new street to carry traffic to and from the station when it is completed.



Designer: Maryland Roads Commission. Fabricator: American Bridge Co.

1942 (CLASS III)—Interchange Bridge at Glen L. Martin Aircraft Plant, Middle River, Md.

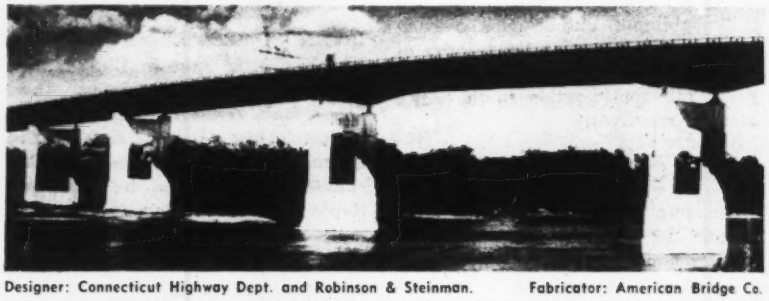
Most Beautiful Steel Bridges of Last Six Years

Beginning anew an annual event that was interrupted by the war, the American Institute of Steel Construction last week awarded stainless steel placques to the nine steel bridges selected as the most beautiful built in their respective classes during the years 1942 to 1947.

Four classes were recognized: Class I: Fixed bridges with spans of 400 ft. or more; Class II: Fixed bridges with spans under 400 ft., costing over $500,000; Class III: Fixed bridges with spans under 400 ft., costing less than $500,000; Class IV; Movable bridges.

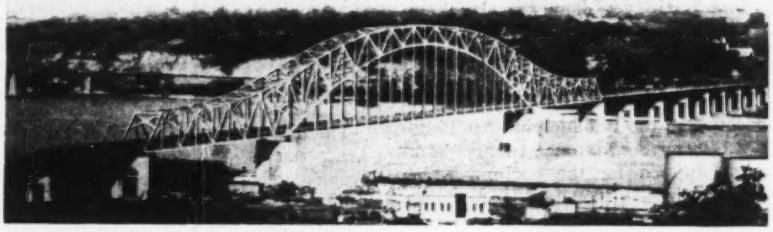
The jury of awards consisted of Douglas Orr, New Haven, Conn., president, American Institute of Architects; A. H. Fuller, professor of civil engineering, Iowa State College; Frederick Wallace Dunn, St. Louis, Mo., architect; George Harwell Bond, Atlanta, Ga., architect; and Waldo Bowman, editor, *Engineering News-Record.*

The bridges receiving the awards are illustrated here, and those given honorable mention are as follows: Class I: Thames River Bridge, New London, Conn. (1943) and Memorial Bridge, Clay's Ferry, Ky. (1945). Class II: Colorado River Bridge, Topock, Ariz. (1945) and Canyon Diablo Bridge, Arizona (1947). Class III: Franham-Irving Bridge, Erie County, New York (1942); Manchester-Billings Bridge, Dutchess County, New York (1942); Portland Street Overpass, St. Johnsbury, Vt. (1944); Rock River Bridge, Grand Detour, Ill. (1947); Connecticut River Bridge, Stratford, N. H. (1947); and Klingle Road Bridge, District of Columbia (1947). Class IV: Chesequake Creek Bridge, Sayreville, N. J. (1943) and the Cerritos Channel Bridge, Terminal Island, Los Angeles County, Calif. (1947).



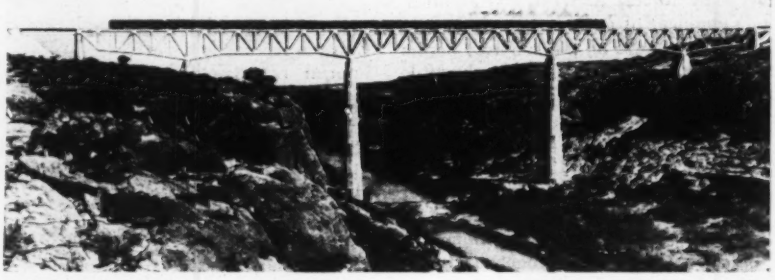
Designer: Connecticut Highway Dept. and Robinson & Steinman. Fabricator: American Bridge Co.

1942 (CLASS II)—Charter Oak Bridge, Hartford, Conn.



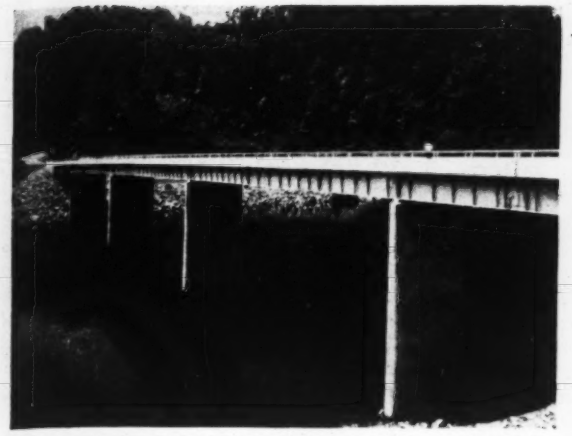
Designer: Howard, Needles, Tammen & Bergendoff. Fabricator, Bethlehem Steel Co.

1943 (CLASS I)—Mississippi River Bridge, Dubuque, Ia.



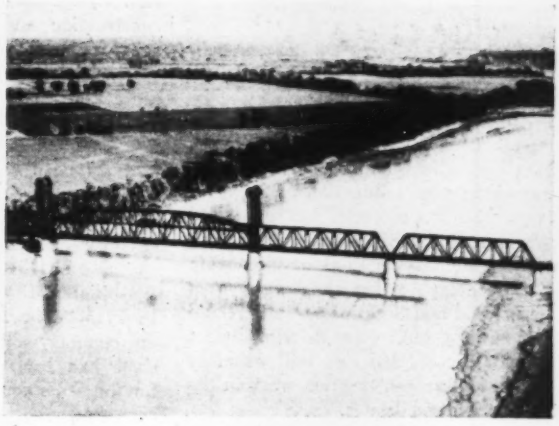
Designer: Modjeski and Masters. Fabricator: Bethlehem Steel Co.

1944 (CLASS II)—Pecos River Bridge, S. P. Ry., Southern Texas.



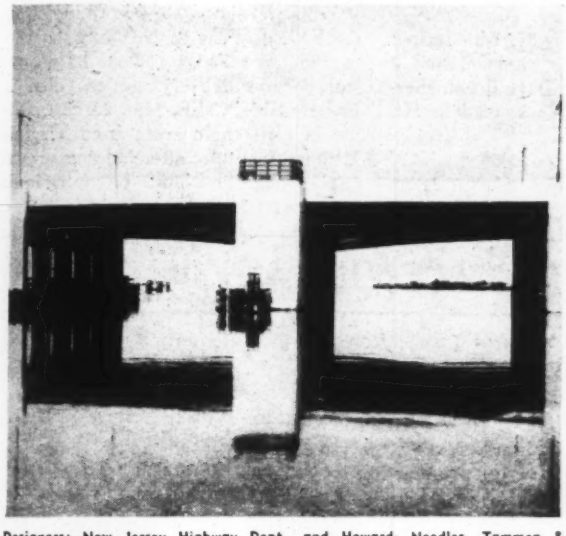
Designer: Tennessee Valley Authority. Fabricators: Virginia Bridge, Carolina Steel & Iron, and Dave Steel Co.

1945 (CLASS III)—Little Tennessee River Bridge, N. C.



Designer: Howard, Needles, Tammen & Bergendoff. Fabricator: American Bridge Co.

1945 (CLASS IV)—Milwaukee R.R. Bridge, Kansas City.

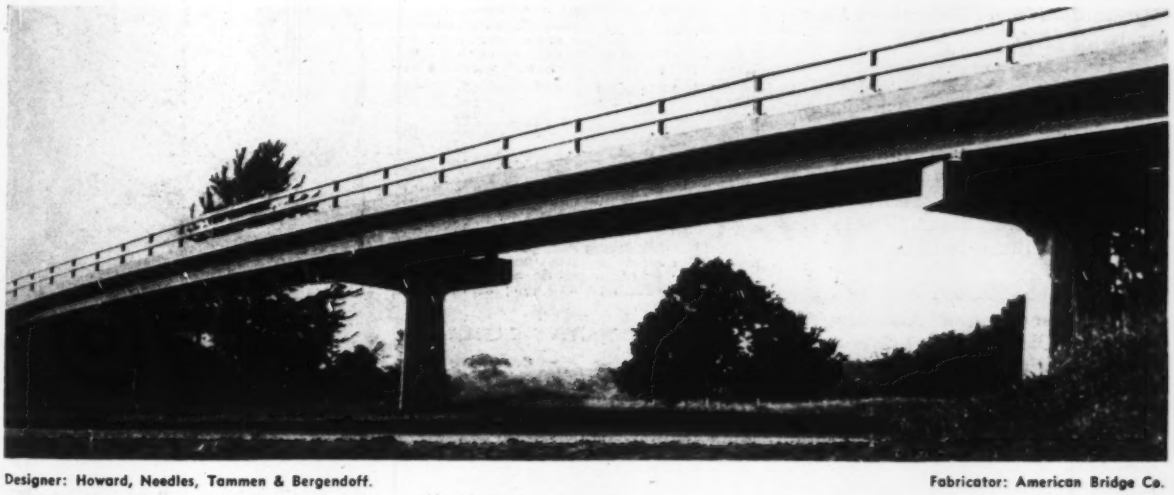


Designers: New Jersey Highway Dept., and Howard, Needles, Tammen & Bergendoff. Fabricator: Bethlehem Steel Co.

1946 (CLASS IV)—Absecon Boulevard, Atlantic City, N. J.

Designer: Howard, Needles, Tammen & Bergendoff. Fabricator: American Bridge Co.

1947 (CLASS II)—Saco River Bridge, Maine Turnpike.



Designer: Howard, Needles, Tammen & Bergendoff. Fabricator: American Bridge Co.

1947 (CLASS III)—Old Alfred Road Underpass, Maine Turnpike.

OBITUARY

Albert L. Nelson, 55, general superintendent of the J. Slotnik Co., Boston, Mass., died in Barre, Vt., Sept. 23. A pioneer in mass production methods for large housing projects, he supervised the construction of Passamaquoddy Village of the Maine tidal development; U. S. Military Academy housing at West Point; and housing projects in Portland and Kittery, Me.; New Britain, Conn.; and Baltimore, Md., as well as other large building construction work in the eastern United States.

Frank C. Huffman, 72, assistant chief engineer of the Chicago & North Western Ry. (retired), died at Wilmette, Ill., Sept. 21. A civil engineering graduate of Purdue University, 1905, he entered railroad service with the C. C. C. & St. L. during the summer months of 1903 and 1904. From 1909 on, he was with the Chicago & North Western in various engineering capacities, eventually becoming assistant chief engineer for the railroad.

Victor H. Cochrane, 69, the engineer who designed the Pensacola Dam on the Grand River in northeastern Oklahoma, died Sept. 24 in Tulsa, Okla. He was a civil engineering graduate of the University of Arkansas and a veteran of the first world war. He was a member of the firm of Cochrane, Hendrix, Fell & Wheeler of Tulsa.

Arthur Kline, 62, Barkhamsted, Conn., resident engineer for the Hartford Metropolitan District Commission, died Sept. 27. Mr. Kline has been resident engineer at Barkhamsted for the last 16 years and prior to that was with the Hartford Water Department for 21 years.

W. Stanhope Tutwiler, 61, prominent in the southern construction industry and partner with J. Doyle Butler of Capital Construction Co., Atlanta, Ga., died Sept. 22. He was a graduate of the Georgia Institute of Technology in 1910 and formed Capital Construction Co. with Mr. Butler in 1934.

Almon John Marsh, civil engineer with Wilbur Watson Associates in Cleveland, Ohio, died Sept. 8.

John P. Paget, 74, construction engineer, born in Harrisburg, Pa., and associated with The Ecuadorian Corporation, Ltd., died recently in Guayaquil, Ecuador. A division engineer and later chief engineer of the Guayaquil-Quito Railway, he played a major role in the construction and organization of that railroad, which connects the interior and mountain district of Ecuador with the coastal ports. Besides doing extensive construction work in Ecuador, Mr. Paget was chief engineer of The Ecuadorian Corporation, Ltd., of Guayaquil.

Robert H. Dalgleish, 73, former chief engineer and more recently consulting engineer for the Capital Transit Co. of Washington, D. C., died there Sept. 23. In 1915 he became chief engineer for the company and retired in 1946, and since had been a consulting engineer for the same company.

Ben B. Hill, 79, civil engineer at Seattle, Wash., from 1906 to 1943, died Sept. 21 on nearby Camano Island, to which he had retired five years ago.

William J. Griffen, 87, who retired in 1930 as consulting engineer and a director of the Miller-Daybill Co., shoring engineers, New York, died in Mt. Kisco, N. Y. Oct. 3.

Matthew P. Brislawn, 64, for many years a civil engineer with the Washington state highway department, died Sept. 29 at Vancouver, Wash. A 1912 civil engineering graduate of Washington State College, he joined the department in 1916.

Virgil R. Brady, 51, died at Harlingen, Tex., Sept. 22. He was a graduate of the Agricultural & Mechanical College of Texas, 1919, and was chief engineer for the Trinity Farms Construction Co., and employed as engineer on construction of the Lower Rio Grande flood control project for the International Boundary and Water Commission from 1933 to the date of his death.

Dudley C. Hull, 55, president of Dudley C. Hull Construction Co., Inc., Savannah, Ga., died Sept. 27.

Edwin B. Jones, 83, who retired from the E. I. du Pont de Nemours and Co. in 1931 as manager of the explosives storage and delivery section, died in Beverly Hills, Calif., Sept. 26. A graduate in civil engineering from Virginia Military Institute, after holding several engineering positions, he joined du Pont in 1893.

CONSTRUCTION ACTIVITY

CONTRACT VOLUME

Continental U. S. Only
(Millions of Dollars)

	Week of Oct. 7 1948	Cumulative 1948 (41 wks)	Cumulative 1947 (41 wks)	% Chge
Federal	$7.9	$765	$509	+50
State & Mun.	61.3	2,061	1,362	+51
Total Public	$69.2	$2,826	$1,871	+51
Total Private	101.0	2,617	2,495	+ 5
U. S. Total..	$170.2	$5,443	$4,366	+25

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Millions)

Type of Work	This Week	Cumulative 1948 (41 wks)	Cumulative 1947 (41 wks)	% Chge
Waterworks.	$2.6	$164	$87	+89
Sewerage ..	2.8	172	108	+89
Bridges	3.5	228	147	+55
Highways ..	27.1	828	635	+30
Earthwork, Waterways.	4.8	407	241	+69
Buildings, Public	23.3	849	452	+89
Industrial .	62.5	801	699	+15
Commercial	32.9	1,477	1,454	+ 2
Unclassified	10.7	518	543	— 5

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

NEW PRODUCTIVE CAPITAL

*Revised	Cumulative 1948 (41 wks)	Cumulative 1947 (41 wks)	% Chge
NON-FEDERAL ..	$3,626	$1,840	....
Corporate Securities	1,668*	643	....
State and Municipal	1,466*	949	....
U. N. Building Loan	65		....
Fed. Aid Highway.	427	248	+72
FEDERAL	1,559	819	+90
Total Capital	5,185	2,659	....

As Reported this week to ... *Engineering News-Record*

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost..	Sept.'48	476.80	229.20
Building Cost.....	Sept.'48	356.70	192.82
Volume	Sept.'48	241	106

New

THE 401 **PONY DITCHER**

The 401 Pony—smallest ditcher built. Don't waste time and money, moving earth to lay small pipe. Put the rugged Pony-sized 401 to work ditching for service pipe, cable and buried irrigation pipe. Only 6″ and 8″ cutting width; 4′ cutting depth . . . it leads the parade of new Buckeyes coming off the assembly lines.

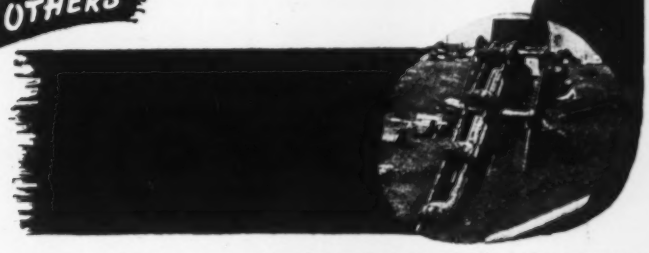
THE 406

With the 406 General Utility Ditcher you can handle a wide range of gas, sewerage, water, telephone conduit and highway drainage, fast and economically. Gives you wide choice of speeds and feeds. Renewable easy-change rooter bits on clean-cutting buckets with 15″ to 24″ cutting widths, and 6′ to 8′ depth. You can undercut cross mains, walks and driveways. You'll like its ease of operation, its automotive controls.

THE 312

The Buckeye 312 is the "last word" for your cross-country job. Ideal for long water and gas mains, sanitary district work, and pipelines. Digs a ditch 16″ to 30″ wide, and up to 6′ deep. Diesel powered . . . hydraulic coupled transmission. Renewable easy-change rooter bits. Light, strong tubular welded steel frame. You'll recognize 55 years of leadership in the new complete line of Buckeye Ditchers.

OTHERS



New Speedy-Change Rooter Bits Now Available for Buckeye Ditchers

GAR WOOD GW INDUSTRIES

IVISION, FINDLAY, OHIO

Buckeye

Ditchers · Shovels · Spreaders · Finegraders

MAIL NOW

GAR WOOD INDUSTRIES, INC.
Findlay Division, Findlay, Ohio.

Please send me the new bulletin on:

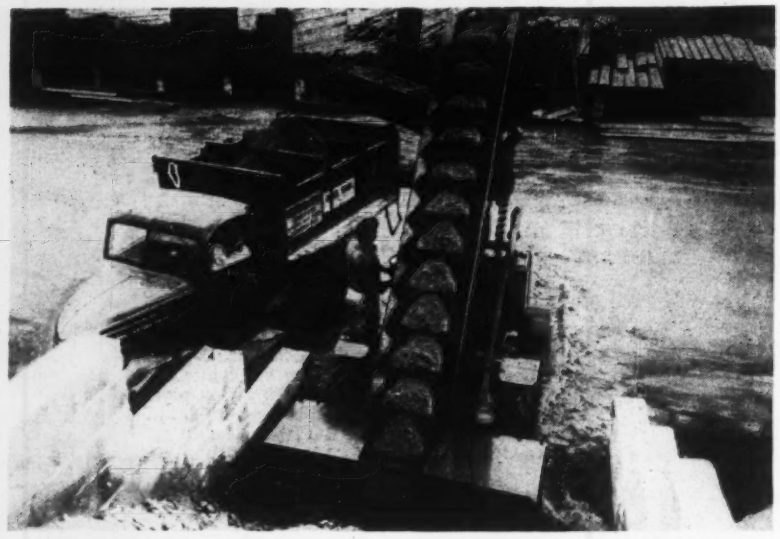
☐ PONY DITCHER ☐ 406 DITCHER
☐ 312 DITCHER ☐ 120 DITCHER
☐ 160 DITCHER

Name.....

Company.....

Address.....

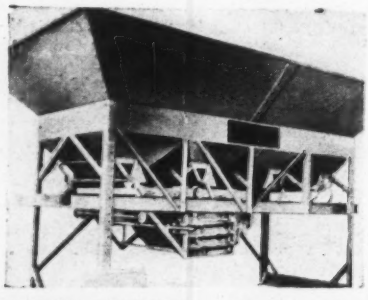
NEW PRODUCTS



BUCKET LOADER — Heavy enough for pit and road work yet maneuverable, the K-5 bucket loader is equipped with a 2-chain elevator and 4-speed transmission. Separate twin-disc clutches control traction and elevator, and the latter has an automatic overload release. The K-5 handles earth, gravel or broken stone up to 2½ in. It moves short distances under its own power and is equipped with self-steering tow bar for long hauls. Power unit is a 27-hp. gasoline engine.—*N. P. Nelson Iron Works, Clifton, N. J.*

BLOCK-LIFT—Invented by master mason, block-lift reduces work in handling building blocks. It is of cast aluminum weighing only 32 oz. Acting as a handle its open jaw grips either end web firmly to lift, place or true-up the block. Excellent leverage makes handling heavy blocks an easy one-hand operation that saves hands, gloves and back.—*Block-Lift Co., Mount Vernon, Ohio.*

DRAGLINE BUCKET—More efficient operation is claimed for the recently announced *Short Cycle* dragline bucket. It is designed with the center of gravity slightly to the rear of the normal position. Thus, the bucket can be hoisted sooner without spilling and this results in an average time saving of 29 percent per cycle. Sizes available range from 1¼ to 12 cu. yds.—*Berner Engineering Co., 1955 Lafayette St., Santa Clara, Calif.*



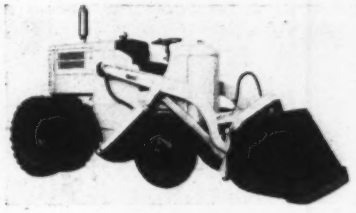
LO-BIN BATCHER — Stressing low overall height, the Lo-Bin Batcher is designed to serve three types of portable mixers. With adjustable legs for lowering or raising bin and batcher, the unit has heaped storage capacity of 30 tons and measures 9½ ft. high. Struck capacity without top panels is 8 tons, and height is 7½ ft. Hopper capacity is 22 cu. ft. Bin has 45-deg. bottom slopes and double 42-in.-wide discharge gates. Two weigh beams in the trolley batcher scale have a 1600-lb. capacity. Major poise weight of weigh beam drops in notches at 100-lb. intervals. Minor poise can be set to 2-lb. intervals.—*C. S. Johnson Co., Champaign, Ill.*

LIGHT WEIGHT MAGNESIUM LADDERS—Made of Dow metal, new designs in magnesium ladders include extension, straight, and step, weighing only 2/3 to ½ as much as comparable wooden models. Easy to move and handle. Do not chip, splinter, warp, or dry out when exposed to heat or rot in damp weather. Fabricated from extruded sections which are readily joined. —*Magnesium Products Corp., 150 Broadway, New York, N. Y.*

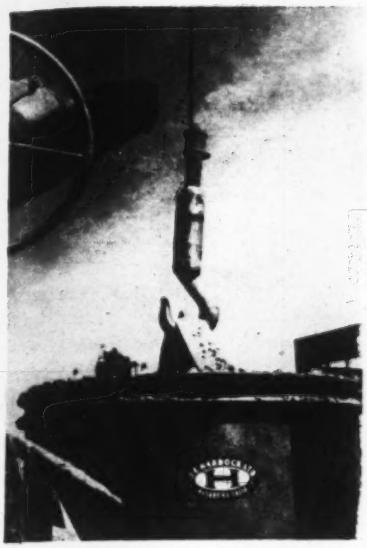
HIGH-TOWER SCAFFOLDING—Tubular steel construction permits adjustability and flexibility and requires less material in erecting high-tower scaffolding. Any desired height is attained with rigidity and safety. Joints are electrically welded.—*Bil-Jax Inc., Archbold, Ohio.*

WOOD PIPE PRESERVATIVE—Pentachlorophenol protects wooden and wood-lined pipes against decay and insect attack. The preservative is nonvolatile, insoluble in water, and can be mixed with inexpensive light oils to make it practically colorless and permit painting after wood has been treated.—*Dow Chemical Co., Midland, Mich.*

STRUCTURAL GLASS—A new shade of structural glass known as alamo tan has gone into production to replace ivory vitrolite which no longer can be made because of the ban on the use of uranium. It is a warm, rich, light color that like ivory will be particularly suitable for bathrooms and kitchens in the home and for walls of toilet rooms in public buildings and for store fascades. With its addition, the manufacturer now is making nine colors of structural glass, including white, black, peach, light gray, red, cadet blue and mahogany. Several others may be added.—*Libbey-Owens-Ford Glass Co., Toledo, Ohio.*



IMPROVED PAYLOADER — Gradual or abrupt dumping can be accomplished with the addition of hydraulic bucket control to the 10½ cu.ft. and 1¼ cu.yd. Payloaders. Advantages are elimination of grounding and dragging the bucket to close it and ability to deposit portions of the load in two or more places.—*Frank G. Hough Co., 801-G Sunnyside Ave., Libertyville, Ill.*

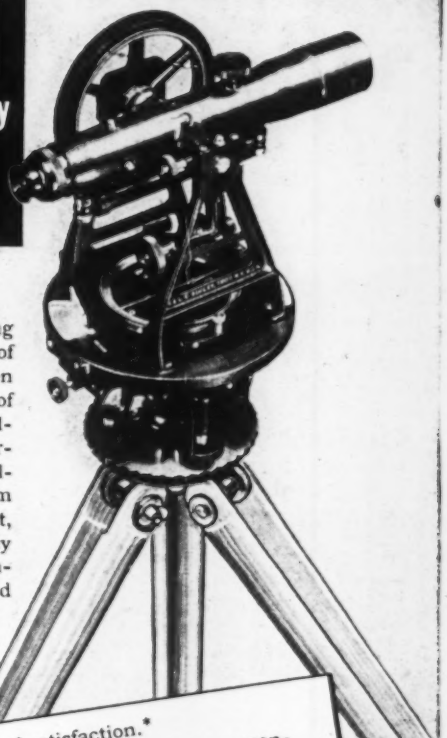


BALL BEARING SWIVEL—Twist and line unlaying of wire hoisting lines are likely to be eliminated through the use of this annular ball bearing swivel. Pictured is a heavy concrete bucket held in position by the Miller Whip Line Special. This model of swivel has a 32-lb. weight which is sufficient to return a whip line to the ground when using a long boom. Even under a maximum load of 77,000 lb. the swivel can be turned by merely grasping it with the thumb and forefinger.—*General Machine & Welding Works, Pomona, Calif.*

SMALL ELECTRIC LIGHT PLANT—Generates 350 watts alternating current, weighs only 77 lb. and is small enough (less than 2 cu. ft.) to fit into trunk compartment of automobile. Powered by 4-cycle air cooled Onan engine.—*D. W. Onan & Sons, Inc., Minneapolis 5, Minn.*

CLAY SPADE—Weighing only 18 lb., and 19 in. long, the new LeRoi 31 spade enables the operator to do more work with less effort. Oil from a large reservoir in the handle is metered into the live air stream and carried to every working part.—*LeRoi Co., 1706 S. 68th St., Milwaukee 14, Wis.*

7 reasons why so many engineers say "Give me a Gurley"



An engineer knows from long experience that he is certain of his surveying instruments when he is certain of the maker...of its progressiveness, of its knowledge of his problems, of its year-in and year-out devotion to quality. That's why so many, from beginner to seasoned specialist, say, "Give me a Gurley". They know in specifying a Gurley instrument that they are assured of *all* these advantages:

1. Unqualified guarantee of satisfaction.*
2. Over 100 years of continuous and undivided concentration on instrument making.
3. An engineering organization with field experience, where the field man's problems are known and understood (a heritage of the first William Gurley, an engineer and surveyor himself).
4. The service records of many Gurley craftsmen date back 25 to 50 years.
5. A completely modern plant for producing parts from the casting up—its own foundry, toolroom, complete optical facilities, collimator departments for final adjustments and testing.
6. A research department which has pioneered many improvements in surveying instruments.
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An Official Survey

Your first reaction to the statement on the opposite page may be—"remarkable if true." For it *is* remarkable but it is also true. And it is backed by the findings of an official survey sponsored by three water works associations.

This recently completed survey shows that of all the cast iron water mains, in sizes 6-inch and larger, ever laid by 25 cities, large and small, from Canada to Florida, *96% are still in service.*

The cities were selected, and the survey directed, by a Joint Committee representing the American Water Works Association, the New England Water Works Association, and the Institute of Water Supply Utilities. The achieved purpose was to ascertain the actual length of life of various water works facilities—mains, valves, hydrants, pumping equipment, etc.

The findings are reported in detail for each city in a book published by the American Water Works Association, which ought to be "must reading" for almost everyone connected with the water works industry. Cast Iron Pipe Research Association, Thomas F. Wolfe, Engineer, 122 South Michigan Avenue, Chicago 3, Illinois.

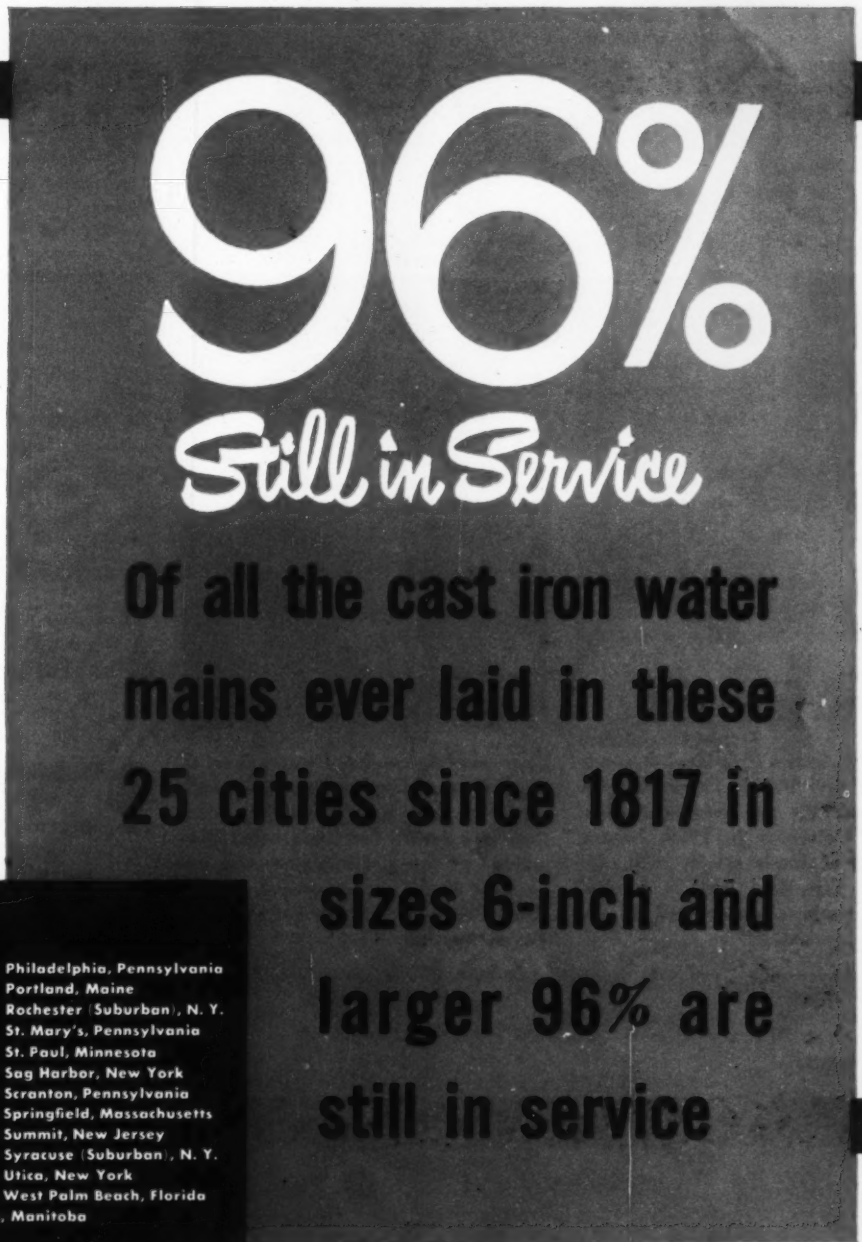
Mr. Q-Check says:
Alexandria, Virginia, laid its first cast iron pipe in 1852 and 99% of all sizes laid from that date is still in service.

P.S.: If you are interested primarily in the survey findings as they pertain to cast iron water mains send for our brochure "Survival and Retirement Experience with Cast Iron Water Mains."

CAST Q IRON

CAST IRON PIPE

Backs This Statement


96%
Still in Service
Of all the cast iron water mains ever laid in these 25 cities since 1817 in sizes 6-inch and larger 96% are still in service

Alexandria, Virginia
Babylon, New York
Clinton, Iowa
Clyde, New York
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Huntington, W. Va.
Jamaica, New York
Merrick, New York
Norwich, New York
Ottawa, Ontario
Philadelphia, Pennsylvania
Portland, Maine
Rochester (Suburban), N. Y.
St. Mary's, Pennsylvania
St. Paul, Minnesota
Sag Harbor, New York
Scranton, Pennsylvania
Springfield, Massachusetts
Summit, New Jersey
Syracuse (Suburban), N. Y.
Utica, New York
West Palm Beach, Florida
Winnipeg, Manitoba

SERVES FOR CENTURIES

MEN AND JOBS

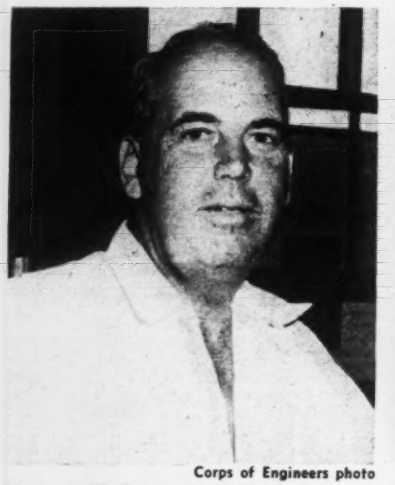
Edmund Besselievre, who has been on a year leave-of-absence from The Dorr Co. to aid in drafting a long-range development program for Argentina, has returned to the company where he will be in charge of the foreign sanitary-engineering division. Mr. Besselievre has gone to Brazil where he will carry on his activities for the next six months.

Lt. Col. Howard A. Morris, Corps of Engineers, has been assigned as area engineer for the Oahe Dam project in South Dakota. He is a West Point graduate, 1946. As engineer officer of the headquarters command at Frankfurt, Germany, he supervised construction of administration installations there.

James R. Gentry is assistant county engineer of Muscatine County, Iowa.

C. E. Brashear is resident engineer for the VA hospital project in Minot, N. D.

T. F. Matson is engineer for farm-to-market roads in Hancock County, Iowa.



Corps of Engineers photo

Norman W. Brown is resident engineer of Barker and Addicks Reservoirs, Addicks, Tex. He was graduated from Syracuse University in 1920, joining the Corps of Engineers in 1933. He has been associated with many outstanding projects constructed by the Galveston district.

Election of Clement J. Freund, dean of the College of Engineering at the University of Detroit, as president of the American Society for Engineering Education for the 1948-49 year was announced at the recent annual convention of the society at the University of Texas, Austin.

Inspecting the foundation of a new low-lift pumping station for the Cuyahoga River water treatment plant, Akron, Ohio, are: (left to right) George A. DeLuca, owner of the DeLuca Construction Co., Wendell R. LaDue, chief engineer and superintendent, Bureau of Water and Sewerage, and A. F. Ranallo, construction superintendent.

Clarence Turnell is highway engineer for Wright County, Minn.

Jay White, Jr., Three Rivers, Mich., has been appointed city engineer in Sturgis, Mich.

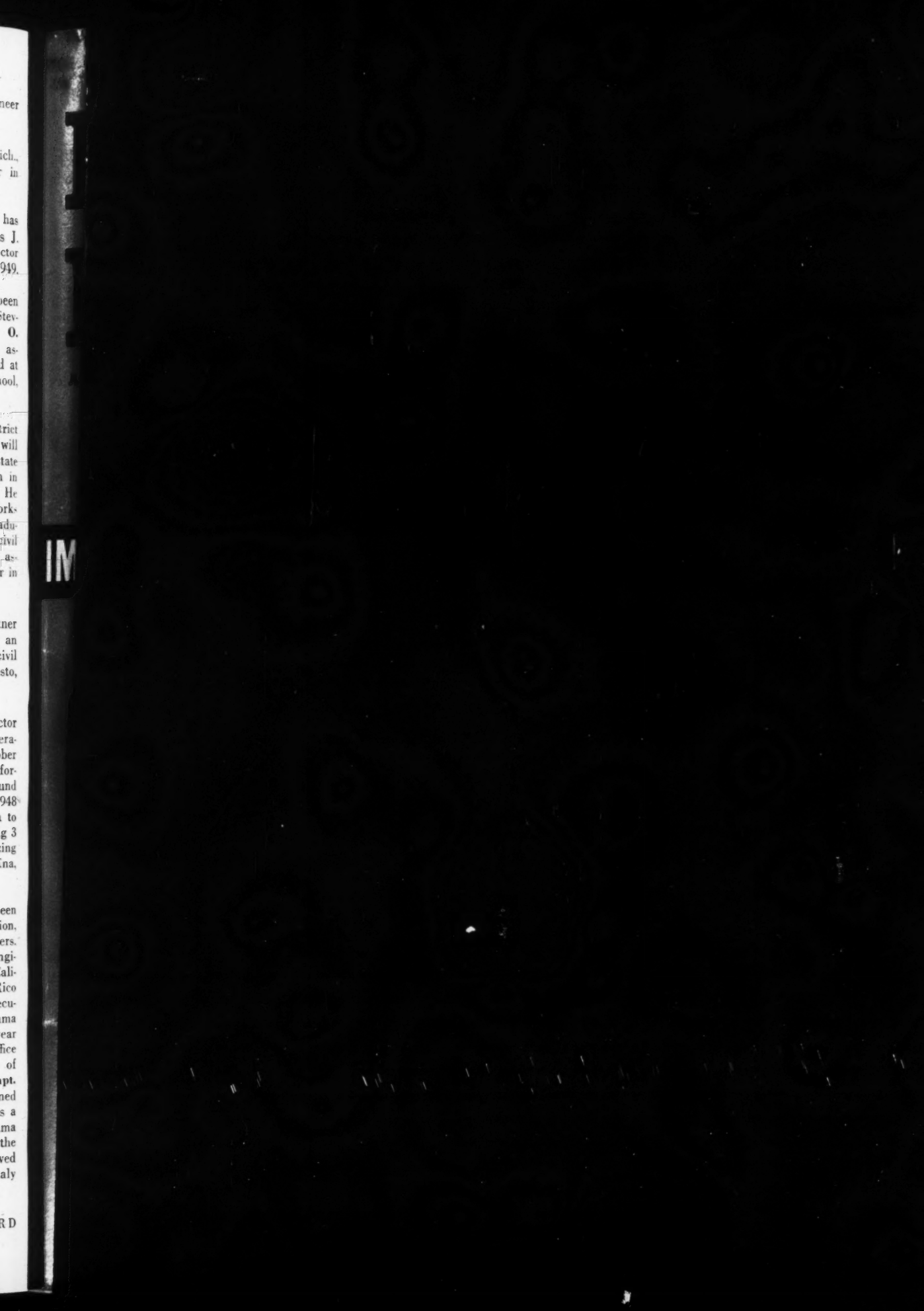
George B. Sowers, Cleveland, has been reappointed by Gov. Thomas J. Herbert as Ohio public works director for the 1-year term ending July 31, 1949.

Lt. Col. Vincent C. Frisby has been named resident engineer at Fort Stevens, Ore., succeeding **William O. Owens,** who will continue as his assistant. He formerly was stationed at the command and general staff school, Fort Leavenworth, Kan.

Herbert L. Michael, assistant district state engineer in Rochester, N. Y., will retire Sept. 30. He has been in state service for 42 years and has been in his present post for the last six. He joined the Department of Public Works in Albany in 1906 after being graduated from Tufts College with a civil engineer's degree. He was made assistant district engineer in Rochester in 1942.

Lawrence Adams, formerly a partner of Bundy & Adams, has opened an office to practice as a consulting civil engineer at 817 Tenth Street, Modesto, Calif.

J. H. Sembower, executive director of the new International Road Federation, set up by American oil, rubber and auto manufacturers to assist foreign countries in developing sound highway programs (*ENR* July 22, 1948 p. 42), has gone to South America to promote the IRF idea there. During 3 months, he will assist in organizing good roads groups in Brazil, Argentina, Uruguay and Venezuela.

Lt. Col. Jeff W. Boucher has been named chief of the operations division, Memphis district, Corps of Engineers. He has a master's degree in civil engineering from the University of California. He has served in Puerto Rico and the Canal Zone where he was executive officer for the joint staff, Panama Canal Department. For the last year he was assistant executive in the office of Lt. Gen. R. A. Wheeler, Chief of Army Engineers in Washington. **Capt. Ernest T. George, Jr.** has been assigned to general duty at Memphis. He is a graduate of the University of Alabama and has a master's degree from the University of California. He has served in England, North Africa, Sicily, Italy and Corsica.

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